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Original Communications.

ON THE DESTRUCTION OF MOSQUITOES—A CONTRIBUTION TO THE STUDY OF CULICIDAL SUBSTANCES, BEARING UPON THE PREVENTION OF MALARIA BY THIS MEANS.

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The pain and discomfort produced by the bites of mosquitoes in man have been universally recognized even from ancient times. And now, after the latest studies, by which it has been proved that the insects of this family of Culicidæ are the definitive host of the malarial parasites, to the above must be added the enormous injuries they cause by their bites.

The destruction, therefore, of these insects which are so injurious to us, and nothing but injurious, has become a social necessity.

Popular experience has already made some attempts in this direction, which we shall have occasion to refer to later on. But to-day an apposite experimental study that, succeeding, would have an importance analogous to that which disinfecting substances

have had for bacterial diseases, has become more than ever essential.

It is necessary, however, above all, to fix well certain principal biological conditions in which the mosquitoes exist that are to be destroyed; and more especially the genus and species to which they appertain, the age, time of captivity, certain pathological states, and the stage of development.

Genus and Species.—It not being known whether to the means of destruction the various genera and species oppose an equal resistance, the necessity arises of indicating clearly and distinctly the zoological names of the mosquitoes that are experimented upon.

Age.—This has an influence in the larval stage as well as in that of the winged insect. For example, we find that the minimum resistance, other things being equal, is offered by the larva directly it comes out of the egg, and by the mosquito soon after it develops from the nympha; and the maximum by the larva which is about to become a nympha, and by the perfect insect captured in the air.

Time of Captivity.—It is rarely that the laboratory environment can be as favorable to the life of the mosquitoes as the natural environment; therefore both the larvæ and the perfect mosquitoes directly they are captured have always a greater resistance to the culicidal substances; and in consequence all our observations refer to a material freshly arrived from the Roman Campagna.

Pathological States.—Sometimes directly after they are found, more frequently after they have been in the laboratory, the larvæ present, in greater or less numbers, a waxy whitening of their bodies, in which state they offer less resistance to the destroying agents. And, above all, it is necessary to note particularly the *stage of development*—that is, whether they be eggs, larvæ, nymphæ, or perfect mosquitoes; in this last stage they live in the air, in the others they live in water; hence the necessity of varying the culicidal substances according to the environment where they live. And even when they are in the water the resistance of the larvæ varies very much from that of the nymphæ, these latter being, as a rule, more resistant than the former.

Thus the classification of the culicidal substances must be made on the basis of the stage of development of the insects which one wishes to destroy. We therefore have:

1. Substances that kill the eggs.
2. Substances that kill the larvæ.
3. Substances that kill the larvæ and nymphæ.
4. Substances that kill the perfect mosquitoes.

SUBSTANCES THAT KILL THE EGGS OF MOSQUITOES.

We have experimented on the eggs of the *Culex pipiens*, the most easy variety to be obtained in quantities, and we have found that those substances, even in greater proportions, which kill, as we shall see, the adult larvæ, are not always sufficient to kill the eggs.

However, the very young larvæ, especially directly after they are born, resist but little the action of these substances, even when very diluted. This, from the practical point of view, is important, inasmuch as it assures us that even with very dilute substances, and consequently cheap ones, when the eggs do not die, the larvæ die directly they come out of the eggs; which practically is the equivalent of the destruction of a species.

SUBSTANCES THAT KILL THE LARVÆ OF MOSQUITOES.

The *popular* experiments made for this purpose in America are reduced to the employment of a very common substance in use in that country fifty years ago, but never universally diffused—viz., petroleum—and to the more recent use of permanganate of potassium.

The history of the other researches already made for the same end is very short, inasmuch as it is limited, as far as we know, to the American studies.

In America mosquitoes are a regular plague in many localities, and consequently several entomologists have tried to free these places from them—thus, in 1890, Robert H. Lamborn,* and under his direction Aaron, Week, Bentenmüller, Macaulay, McCook; and later† Howard (1893), Herbert Osborn (1892–96),‡ chief of the Division of Entomology, Department of Agriculture, have carried out researches. The results were not, in truth, very comforting, and they refer almost exclusively to the use of petroleum.

Thus Aaron says that, in 1890, he had found that a drop of petroleum (!) dropped into a puddle of ten square feet killed in fifteen minutes (!) all the larvæ and nymphæ of the mosquitoes which existed there, while

*"Dragon Flies *vs.* Mosquitoes. Can the Mosquito Pest be Mitigated?" New York, 1890.

†"Die Mosquito-Malaria-Theorie," von G. H. F. Nuttal. *Centralbl. f. Bakteriol.*, vol. xxv, 1899.

‡U. S. Dept. of Agriculture, Division of Entomology. Bulletin No. 5, New Series, 1896.

the Crustaceæ and the larvæ of the Odonatæ or Libellulidæ survived.

Howard states that he succeeded, in 1893, in killing with petroleum all the insects in a pond of sixty square feet; and in the following year, having on June 4, in the neighborhood of Washington, covered a pond of 100 square feet with a stratum of petroleum (five gallons), in June and July he saw no mosquitoes develop, though they usually infest that place. Consequently, he maintains that with a little petroleum one can free many localities from mosquitoes.

Osborn also maintains that "probably the best and easiest of all remedies against mosquitoes is the use of petroleum on the surface of ponds." And he adds that this use was already known; but having made, in 1892, experiments on a large scale, he found that an ounce of petroleum for every fifteen square feet of surface of a small pond was sufficient for this purpose for a month, but that sometimes it was necessary to renew it more frequently. Since 1892, having repeated his experiments, he assures us that he has succeeded with petroleum alone in freeing two localities from mosquitoes; so that, in 1896, he proposed to experiment with it on large ponds, the cost being insignificant, and it being possibe to scatter it with a large broom against the wind from the dikes or from a boat.

What the result of these experiments has been we do not know; nor does the above mentioned very minute and accurate review of Nuttal, which has lately appeared, mention it.

For our part, after many trials, we have convinced ourselves that, apart from the question of expense, which outside of America is very considerable, the action of petroleum in destroying the larvæ of mosquitoes does not certainly occupy the first place, and it is also true that in some cases the use of other substances would not be more advisable.

Up till now very few substances have been used for this purpose in this relation; we know only that Whitfield in Atlantic City has added green vitriol to water containing larvæ of mosquitoes.

We know of no precise researches made with potassium permanganate, one of the substances much extolled for the destruction of mosquitoes.

Among the indirect researches that are directed to destroy the malarial germs in a locality by means of permanent drainage (*bonifica*), we may mention that Lanzi and Terrigi, in 1873, extensively applied a treatment of caustic lime mixed with water in the excavations in the Colosseum, and it was then observed that the workmen employed in the excavations did not suffer from malarial fever. An analogous experiment with identical result was subsequently made by Salisbury.*

We, however, have wished to make a study, as complete as possible, of all those chemical substances which, owing to their more or less low price, could be freely used for the destruction of mosquitoes in water.

As the criterion for judging the larvicidal action of a given substance, we have taken the time it takes to kill the larvæ, considering that substance inefficacious which does not kill them at most within three days (seventy-two hours). And, consequently, according to this criterion all the substances up till now tested by us are divided into two great categories:

A. SUBSTANCES THAT DO NOT KILL THE LARVÆ OF MOSQUITOES.

Among these, which now amount to 198, we find, besides the 167 coloring substances:

Permanganate of potash in solution $\frac{N}{100}$ and 1:1000.

Arsenious acid in ammoniacal solution 10:1000.

Various soaps (except an extract of tobacco).

Petroleum itself (so extolled by the Americans), also in the proportion of 0.05 per 100 c.m.q. of surface at a temperature of 18° C.

Ammonia (1:100 at 18° C.); tannic acid (1:1000); borax (1:1000).

Gaseous water (with CO_2), sulphurous water (with H_2S).

Analogously we have observed that the larvæ and nymphæ of mosquitoes live very well in the Aque Albule of Tivoli and in sulphurous waters of the same type.

B. SUBSTANCES WHICH KILL THE LARVÆ OF MOSQUITOES.

We here give the list of these substances, dividing them into two tables, in the first of which (see Table I) we enumerate various chemical substances, and a few vegetable infusions; in the second (see Table II) we place the most efficacious of the staining substances derived from coal tar; in the third (see Table III) we analyze the action of the most active among these last.

* Cited by Tommasi-Crudeli, "Sulla produzione naturale della malaria." Memoria 2a. Accademia dei Lincei, 1880.

TABLE I.

Action of culicidal substances on larvæ of mosquitoes (*C. pipiens, C annulatus*) at the ordinary temperature (18° to 20° C.).

No.	Substances used.	Maximum duration of life of the larvæ.
1	Tobacco leaves, aqueous saturated solution of	3 hours.
2	Potash N/10	4 "
3	Powder of chrysanthemums (unexpanded flowers) 0.003:1000	7 "
4	Corrosive sublimate 1:1000	10 "
5	Powder of chrysanthemums (2d quality) 0.06:1000	12 "
6	Sulphurous water, non saturated	12 "
7	Salt water (5-10:100 NaCl)	15 "
8	Extract of tobacco of commerce at 10:100	20 "
9	Bisulphites of soda and of potash 1:100	20 "
10	Powder of chrysanthemums (2d quality) 0.010:1000	24 "
11	Sulphate of copper 1:100	24 "
12	Sulphate of iron 1:100	24 "
13	Coal tar	30 "
14	Ammoniacal water from coal-gas	45 "
15	Milk of lime 5:100	48 "
16	Potassium bichromate $2+H_2SO_4$ 3 at 1:1000	48 "
17	Sulphuric acid 1:1000	48 "
18	Quassia, saturated aqueous infusion of	72 "
19	Solanum nigrum, aqueous infusion of	72 "
20	Daphne guidium, aqueous infusion of	72 "
21	Sodium sulphuret, saturated aqueous solution of	72 "
22	Potassium permanganate 5:1000	72 "

TABLE II.

Action of aniline colors on larvæ of mosquitoes (*C. pipiens, C. annulatus*).

No.	Colors used (0 50:1000).	Maximum duration of life of the larvæ.
1	Gallol	12 hours.
2	Green malachite A	12 "
3	A. Erastz II	24 "
4	Yellow martins (sodic salt)	24 "
5	Methyl-violet	24 "
6	Ethyl-violet	24 "
7	Azoviolet	24 "
8	Chrysoidin cryst	24 "
9	Cyanin	24 "
10	Green malachite B	48 "
11	Yellow martins	48 "
12	Rhodamin B	48 "
13	Victoria blue	48 "
14	Dahlia	48 "
15	Gentian violet	48 "
16	Pure neutral violet	48 "
17	Nachtblau	48 "
18	Pure brown	48 "
19	Basle blue B B	48 "
20	Toluidin blue	48 "
21	Aurin	48 "
22	Curcumine, extra F F	48 "
23	Phosphin, extra	48 "

TABLE III.

Culicidal action on the larvæ of mosquitoes (genus Culex) of aniline colors in diverse proportions.

No.	Color.	Proportion per mille.	Duration of life of the larvæ.
1	Gallol	0.50	6 to 12 hours.
		0.025	16 to 24 "
		0.0125	24 to 36 "
		0.0062	30 to 72 "
		0.0031	36 to 96 "
		0.0015	48 to 108 "
		0.0007	72 hours, survive.
2	Green malachite A.	0.50	6 to 12 hours.
		0.025	24 to 26 "
		0.0125	34 to 48 "
		0.0062	36 to 108 "
		0.0031	48 hours, survive.
		0.0015	Survive, *id.*
		0.0007	*id.* *id.*

Once for all we state that the results synthetically and summarily shown in the tables represent the mean of the experiments, always repeated many times, and with a large number of culicides.

From the three preceding tables it results that:

1. Among the mineral substances, permanganate of potash even in the considerable dose of 5:1000 is, among the larvicidal substances, one of the slowest to act; lime, sulphate of iron and of copper, and NH_3, act rather slowly even in very large proportions; sulphurous water, even when not saturated with SO_2, is one of the most active larvicidal substances; corrosive sublimate in the strong dose of 1:1000 kills the larvæ slowly, but not the nymphæ.

2. Among the vegetable substances, very potent poisons to the larvæ are the leaves of strong tobacco and some commercial insecticide powders, which are made of the unexpanded flowers of chrysanthemums. Other commercial insecticide powders were either less active or altogether inefficacious. Then comes the commercial extract of tobacco, and finally a saturated aqueous infusion of quassia, of *Solanum nigrum*, and of *Daphne guidium*. We shall see that the above mentioned powders in larger proportions also kill the nymphæ.

3. Of the aniline colors (blue, violet, red, yellow, and green) that we have experimented with, the two which have the most energetic action are the gallol of Weilerter-Meer of Uerdingen, and the green malachite of Actiengesellschaft für Anilin-Fabrikation of Berlin. Of these two colors the gallol is the more active. Its certainly larvicidal dose is 0.0062:1000; that of the former is 0.0125; the minimum larvicidal dose of the first may descend to 0.0007, while that of the second is never less than 0.0037.

SUBSTANCES WHICH KILL LARVÆ AND NYMPHÆ OF MOSQUITOES.

We have already seen that some substances which readily kill the larvæ have no action on the nymphæ, so that these may complete their development and transform themselves into the aerial insect.

We shall now see which are the substances that kill both the larvæ and the nymphæ of mosquitoes; they are arranged in the following table according to the time required for killing the larvæ:

TABLE IV.

Action of culicidal substances on larvæ and nymphæ of mosquitoes (*C. pipiens, C. annulatus*) at the ordinary temperature (18° to 20° C.).

No.	Substances used.	Maximum duration of life.	
		Larvæ.	Nymphæ.
1	Saturated sulphurous water (SO_2)	10 to 50 min.	25 min.
2	Potassium permanganate 0.3+HCl 5:1000	15 min.	1 hour.
3	Salt water (saturated solution of NaCl)	30 "	1 "
4	Chrysanthemum powders (unexpanded flowers) 0.50:1000	1 hr. 15 min.	1 hr. 35 min.
5	Chrysanthemum powders (2d quality) 0.50:1000.	2 " 30 "	3 hours.
6	Petroleum Cc. 0.20 in 100 c.m.q. of surface	4 hours.	4 "
7	Potassium permanganate 2:100	4 "	8 "
8	Ammonia 2:100	5 "	6 "
9	Oil (a very thin stratum covering all the surface of the liquid)	6 "	4 "
10	Petroleum Cc. 0.10 per 100 c.m.q of surface.	6 "	6 "
11	Potassium permanganate 1.5 100	6 "	18 "
12	Chrysanthemum powders (unexpanded flowers) 0.006:1000	7 "	9 "
13	Formalin (formaldehyde 40:100)	8 "	12 "
14	Carburet of lime 10:1000	8 "	8 "
15	Chrysanthemum powders (2d quality) 0.06:1000.	11 "	12 "
16	Lysol 0.5–0.1:100	12 "	24 "
17	Milk of lime 10:100	24 "	36 "
18	Commercial chloride of lime 1:100	24 "	48 "
19	Commercial chloride of lime 1:1000	36 "	60 "
20	Potassium bichromate 1:1000	48 "	60 "
21	Potassium permanganate 1:100	48 "	72 "

From the preceding table it clearly results that:

1. The destruction of the nymphæ is in general a rather difficult task, this being the stage of development in which the mosquitoes oppose the greatest resistance to the destroying agents. In fact, as a rule, the nymphæ take a longer time to die than the larvæ, except that in oily substances, which float on the surface, where the nymphæ generally go to breathe, the latter die before or at the same time as the larvæ.

2. Classifying the substances used according to the time required to kill the larvæ, we find in the first line sulphurous water saturated with SO_2, and then potassium permanganate mixed with HCl. The permanganate alone acts much more weakly even in greater proportions (2:100–1:100). Very efficacious are light oily substances, among which is petroleum—that, however, must act at the ordinary temperature, in the proportion at least of 0.10 Cc. per 100 c.m.q. of surface. Common oil has a perfectly analogous action.

Salt water, which at 5–10:100 (see Table I) kills the larvæ in fifteen hours, in concentrated solution kills the larvæ in thirty minutes and the nymphæ in an hour.

Very active also are the above mentioned commercial insecticide powders obtained from chrysanthemum flowers; they act through their active principle, which is soluble in water, and is a true larvicidal and nymphicidal poison.

Caustic lime and ammonia only act in strong doses, and thus also chloride and carburet of lime.

3. Of the most potent disinfectants of bacteria, formalin and lysol are not very active as culicidal substances, and corrosive sublimate, as we have already seen (see Table I), is even less so.

4. The nympha stage being very transitory, in the destruction of mosquitoes it may be neglected in practice.

(A) CONDITIONS THAT MODIFY THE ACTIVITY OF THE SUBSTANCES WHICH KILL LARVÆ AND NYMPHÆ OF MOSQUITOES.

Naturally these conditions are multiple, and we here mention the principal ones: the frequency or not of cooperating substances, the so-called mordants, direct sunlight, the physical and chemical properties of the waters, the state of the waters—that is, the mode in which they are taken—and the age of the larvæ.

1. *Mordants.*—Table IV demonstrates that the permanganate of potash, while it has by itself alone a rather weak larvicidal action, is much strengthened in this action by the addition of hydrochloric acid. But the addition or not of these mordants acquires special importance in the presence of the aniline colors, which we have already seen were capable of killing the eggs or the larvæ of mosquitoes. Consequently we have thoroughly studied this argument for the above mentioned two most active colors; and from the very numerous experiments we have been able undoubtedly to conclude that:

(*a*) Sulphate of iron, lime, chloride of sodium, bisulphate of potash, chromic acid, sulphuric acid, added in equal or double proportion to gallol, hasten a little the action to the extent that in a solution of gallol 0.50 or of mordant 0.50–1:1000, the larvæ die in the least time that the gallol alone requires —that is, in six hours. Chloride of lime, ammonia, iron, alum, borax, a mixture of bichromate of potash and sulphuric acid (1 to 3), do not augment the culicidal action of gallol, just as neither these, nor the other

mordants mentioned, in the proportions indicated, augment it with green malachite.

(*b*) Thus varying contemporaneously the quantity, *per mille*, of the color and of the mordant (selecting, for example, sulphate of iron), and varying either only the quantity of the color or only the quantity of the mordant, this does not produce a notable or decided auxiliary action. Perhaps the mordant is of some use in the minimum larvicidal solutions, rendering them more certainly fatal within seventy-two hours. But with such small results it is not worth the trouble or the expense to add the mordants. This is tantamount to saying that where they exist, for example, in salt water marshes or lakes, it is all the better.

2. *Direct Sunlight.*—This does not injure for a certain time the efficacy of the colors; on the contrary, in the weak coloring solutions in marsh waters, retarding the putrefaction, it makes the larvicidal action last for a long time. Neither does it disturb the action of petroleum, which, however, is disturbed, as we shall see, by the temperature, and therefore also by the summer sun.

3. *Physical and Chemical Properties of the Waters where Larvæ and Nymphæ of Mosquitoes Live.*—One readily understands that they have an importance of the first order. Among the *physical properties* we note at once:

(*a*) Temperature.

(*b*) Turbidity by suspension of earthy particles. As regards this, we shall refer to it in the next section, where we shall treat of the influence of earth on some of the larvicidal substances.

That the *chemical properties* of the waters, where the mosquitoes pass a long portion of their lives, have much influence on the mode and on the time of their eventual destruction is readily understood.

For example, permanganate of potash, having to oxidize the organic substances, will be more readily destroyed in marsh waters, and also in sulphurous waters. Petroleum itself, evaporating and oxidizing, does not very long remain unaltered on the surface of waters. Lime and the alkalies in general combine with the CO_2 which, by the organic decomposition of the earth and of the waters, actively develops.

Among the aniline colors there are some that are little stable; it therefore became necessary, for the practical scope of these researches, to investigate how they act in marsh waters eventually putrid, and in sulphurous waters, which are, as we have said, with us so frequently the nests of mosquitoes. We knew already that the salt of the sea water of the marine ponds along our malarious coast acts as a mordant.

(*c*) Marsh waters. By repeated experiments we have persuaded ourselves that both

TABLE V.

Action of culicidal substances on larvæ and nymphæ of mosquitoes (genus Culex) at diverse temperatures (18° to 20° and 30° to 35° C.).

No.	Substances used.	Maximum duration of life of the larvæ.		Maximum duration of life of the nymphæ.	
		18° to 20° C.	30° to 35° C.	18° to 20° C.	30° to 35° C.
1	Petroleum Cc. 0.20 per 100 m. q	4 hours.	3 hours.	4 hours.	3 hours.
2	Petroleum Cc. 0.10 per 100 m. q	6 "	5 h. 30 min.	6 "	5 "
3	Saturated sulphurous water	20 minutes.	15 minutes.	25 minutes.	20 minutes.
4	Ammonia 2:100	5 hours.	30 "	2 hours.	1 hour.
5	Lysol 0.50:100	12 "	40 "	24 "	40 minutes.
6	Milk of lime 5:100	48 "	2 hours.	Survive.	2 hours.
7	Saturated infusion of quassia	72 "	17 "	"	24 "
8	Gallol 0.0125:1000	24 "	12 "	"	Survive.

The above figures clearly show the influence of temperature on the power of the various substances most efficacious in killing larvæ and nymphæ of mosquitoes. With the rise of temperature, even within the limits of our hot summer, the time of destruction both of the larvæ and of the nymphæ is shortened, except that with petroleum, which, therefore, does not act chemically, but only mechanically —that is, subtracting the atmospheric air by means of its impermeable stratum.

gallol and green malachite, indifferently with or without a mordant, act well even in marsh waters; for example, in the proportion of 0.025:1000 the first repeatedly killed the larvæ of Culex in eight to ten hours, the second in ten to twelve hours. The same can be said of the above mentioned insecticide powders.

(*d*) Sulphurous waters (Aque Albule of Tivoli). With the same two colors, in similar proportions, they act like the marsh waters.

Experiments on a large scale made in the Campagna within ponds of marshy and sulphurous waters have confirmed the above mentioned favorable results obtained in the laboratory researches. The insecticide powders also act in sulphurous waters.

(*e*) Putrid waters. Putrefaction diminishes the efficacy of petroleum, perhaps oxidizing it, and renders it less durable. Instead, even in putrid liquids, gallol at 0.50:1000 acts equally well; still more, it slackens the decomposition. Nevertheless, both in the weaker coloring solutions and in those losing their color through time, directly putrefaction intervenes the larvicidal efficacy of this substance is arrested and suddenly interrupted. The same happens for the mentioned insecticide powders.

4. *State of the Waters* (*Mode of Taking, etc.*).—Above all, it is important to observe whether the earth in the bottom of the marshes, ponds, or lakes, or that in suspension in the waters, alters the larvicidal energy, especially of the aniline colors. For this purpose many comparative experiments were made in large vessels, with or without earth at the bottom, with the two most efficacious colors, mixed or not with mordant, and used in different proportions. We have been thus able to demonstrate that with the presence of earth in the bottom of the vessels the larvicidal action does not change, and with gallol it is maintained, as we shall see, for a long time in proportion to the depth of the water above the earth.

The extension of the surface of the waters in relation to their quantity acquires a notable value for those substances which act on the surface, cutting off or diminishing the area and the respiratory air that the larvæ and nymphæ absolutely require.

In practice there are the two extreme cases of lakes and ponds with a deep bottom, or of small puddles and shallow pools with a large and more or less irregular surface. In both cases the action of petroleum was the object of special researches.

TABLE VI.

Culicidal action of petroleum on larvæ and nymphæ of mosquitoes (genus Culex) at ordinary temperature.

No.	Quantity of petroleum in Cc.	Surface of water in c.m.q.	Quantity of water in liters.	Maximum duration of life.	
				Larvæ.	Nymphæ.
1	0.02	100	1	Survive.	Survive.
2	0.05	100	1	"	"
3	0.10	100	1	6 hours.	5 hrs. 30 min.
4	0.20	100	1	4 "	4 hours.
5	2.00	1000	40	4 "	4 "
6	2.00	10000	40	Survive.	Survive.

From these figures it clearly results that petroleum develops a purely mechanical larvicidal action—that is, subtracting the air. The quantity of it necessary is therefore proportionate to the surface of water to be disinfected. And if the stratum does not cover the whole surface from contact with the atmosphere, its action immediately becomes *nil.*

5. *Age of the Larvæ.*—As we have said in the beginning and have repeated, *apropos* of the destruction of the eggs, the very young or young larvæ are much more easily destroyed than the adult; this is clearly shown in the following table:

TABLE VII.

Action of culicidal substances on very young larvæ of mosquitoes (genus Culex) at ordinary temperature (18° to 20° C.).

No.	Substances used.	Maximum duration of life.	
		Young larvæ.	Adult larvæ (control).
1	Milk of lime 1:1000.....	72 hours.	Survive.
2	Salt water 10:1000.....	72 "	"
3	Salt water 5:100.....	2 "	15 hours.
4	Petroleum 0.05 per 100 c.m.q..	5 hrs. 30 min.	Survive.
5	Petroleum 0.10 per 100 c.m.q.....	3 hrs. 30 min.	6 hours.
6	Gallol 0.50:1000.....	2 hours.	12 "
7	Gallol 0.025:1000.....	4 to 5 hours.	24 "
8	Gallol 0.0125:1000.....	6 hours.	24 "
9	Gallol 0.0062:1000.....	3 to 12 hours.	30 "
10	Gallol 0.0031:1000.....	14 to 16 hours.	30 "
11	Gallol 0.0015:1000.....	24 hours.	48 "
12	Gallol 0.00078:1000.....	36 hours.	Survive.
13	Green malachite 0.50:1000.....	3 to 6 hours.	12 hours.
14	Green malachite 0.025:1000.....	12 hours.	36 "
15	Green malachite 0.012:1000.....	18 hours.	Survive.

Substances which Kill the Larvæ and Nymphæ of the Genus Anopheles.—Up till now we have seen that the larvæ and nymphæ of this genus have the habit of living rather isolated, and they are never found in the malarogenous puddles and ponds in such large numbers as those of the genus Culex. Consequently we have not been able to experiment on material so exuberant as that of the other genera. Nevertheless, of the very young and adult larvæ, as well as of the nymphæ of the two species Claviger and Bifurcatus, we have had sufficient to test them with lime, permanganate of potash, common salt, sulphate of iron, sulphurous water, sublimate, lysol, common oil and petroleum, infusion of tobacco, gallol, and green malachite; and always contemporaneously, for control, we have tested the same substances with the very young and the adult larvæ of the genus Culex.

From the mean of all the experiments we have come to the conclusion that the larvæ

and nymphæ of the genus Anopheles do not oppose a resistance substantially different to the deleterious action of those among the most efficacious larvicidal substances.

(B) DURATION OF ACTION OF THE SUBSTANCES WHICH KILL LARVÆ AND NYMPHÆ OF MOSQUITOES.

This condition is very important from the practical point of view, especially in relation to the cost of the destruction of mosquitoes.

Also in sulphurous waters, as in those which are very marshy, the duration of the effect of the gallol is longer than that of green malachite. Indeed, one sees at a glance that the latter loses its color immediately in aqueous solution, still more if the mordant sulphate of iron be added, and most rapidly after lime, does the color disappear. So that once more we observe the superiority of gallol over green malachite for this larvicidal scope. In all the above mentioned cases the larvicidal efficacy ceased instantaneously, as has been recorded,

TABLE VIII.

Duration of action of culicidal substances on larvæ and nymphæ mosquitoes (genus Culex) in solutions of diverse ages.

Number.	Substances used.	Maximum duration of life of larvæ.				Maximum duration of life of nymphæ.			
		Recent solution.	Solution 1 day old.	Solution 3 days old.	Solution 5 days old.	Recent solution.	Solution 1 day old.	Solution 3 days old.	Solution 5 days old.
1	Saturated sulphurous water at 18° C.....	20 min.	25 min.	50 min.	22 hours.	25 min.	1 hour.	24 hours.	Survive.
2	Chrysanthemum powder 0.50: 1000	2 h. 30 m.	24 hours.	36 hours.	Survive.	3 hours.	Survive.	.....	"
3	Chrysanthemum powder 0.25: 1000	4 hours.	72 "	Survive.	.....	6 "	"	.....	.....
4	Lysol 0.50: 1000 at 35° C.	38 min.	2 "	52 hours.	Survive.	40 min.	6 hours.	Survive.	Survive.
5	Ammonia 2:1000 at 18° C.	5 hours.	12 "	14 "	"	6 hours.	Survive.	"	"
6	Petroleum 0.20 per 100 c.m.q...	4 "	4 "	Survive.	"	4 "	4 hours.	"	.....
7	Petroleum 0.10 per 100 c.m.q.....	6 "	Survive.	.....	.....	5 h. 30 m.	Survive.	"	.....
8	Carburet of lime 10:1000.....	5 "	12 hours.	36 hours.	Survive.	8 hours.	12 hours.	60 hours	Survive.

One clearly sees that of the various substances above used for several days in succession the first to lose its larvicidal action is petroleum, which, evaporating and decomposing, no longer covers all the surface of the water. In fact, in a dose of 0.20 Cc. per 100 c.m.q. it lasts for two days at 18° C.; but at 35° to 57° C. it no longer acts after one day, as also in the minimum larvicidal dose of 0.10 Cc. per 100 c.m.q. The duration of this larvicidal action of petroleum was then compared with that of the two most efficacious coloring substances. For this purpose many experiments were instituted in conditions very similar to those of the Campagna—that is, with marsh waters and with sulphurous waters in large receptacles with and without earth at the bottom. It was found that in marsh waters with earth at the bottom:

Gallol,	at 0.50:1000	after	45	days	is very active.
"	" 0.025:1000	"	14	"	"
"	" 0.0125:1000	"	4	"	"
Green malachite,	" 0.50:1000	"	12	"	"
" "	" 0.25:1000	"	12	"	"

For each of these colors, if the solution is in a very thin stratum above an abundant bottom of earth, the duration of the larvicidal action is shortened a little.

directly the putrefaction of the water began, under the form of a film of proteid on the surface.

The earth of the bottom, the direct sunlight, preventing this appearance of putrefaction even in very dilute coloring solutions, aid in prolonging the larvicidal efficacy of the substances mentioned. And in conclusion, from all our experiments, it undoubtedly results that gallol especially, among all the substances used by us for killing the larvæ of mosquitoes, has the most durable larvicidal efficacy.

(C) PRACTICABILITY.

Above all, it is necessary to know whether the substances largely employable in the Campagna with a larvicidal purpose, wherever the waters are the nest of the larvæ of mosquitoes, are of very easy use; whether they poison these waters eventually, potable for animals and man; whether they injure the plants of irriguous cultures, such as artificial meadow-lands (*marcite*) and rice-fields.

Among all the most efficacious larvicidal substances, sulphur dioxide is not practicable, because to produce burning sulphur more or less cumbersome apparatus are nec-

essary; and even if we were able to have the liquid contained in iron cylinders its use in the Campagna would not be easy, apart also from the question of price. Certainly it would be useful for destroying other insects noxious to agriculture; but it injures the vegetation, as we have proved by an experiment made on a large scale. If this vegetation be of that marshy nature which obstructs the canals and the course of the waters, it would be beneficial, but *vice versa*, if that of the irriguous cultures it would be injurious. For all these reasons the use of sulphur dioxide for larvicidal purposes can only be very limited.

Petroleum, instead, is of relatively easy use, even in large ponds and lakes. It does not kill the fish or the other inferior animals. The herbivora avoid drinking it. In stagnant waters the vegetation, sometimes very abundant on the surface, obstructs its mechanical action; in waters even slightly running its superficial stratum must be frequently or continuously renewed. We may add that its action is proportionate to its diffusibility on the surface of the waters. Consequently, the lighter the petroleum the better it acts; but in this case the action lasts for a shorter time. For example, in commerce there are some qualities of petroleum which, thrown on water, do not spread, but remain in the form of more or less large drops. These are least indicated for the destruction of the larvæ.

The insecticide powders previously mentioned are very easily used, and when swallowed even in big doses by herbivora they are not poisonous; but they are poisonous to some worms, Mollusca, and fishes.

The coloring substances, when they are, like the two above mentioned, very soluble and diffusible in water, are also very practicable and easily used. In practice it is convenient first to make very concentrated solutions, and then dilute these in the waters where the larvæ are to be destroyed. The colorimetric criterion is very convenient for regulating the proportion. Or better, the proportions per mille indicated in Table III are dissolved in water. Then one observes the shades of color of these solutions; and in this way with the eye one can obtain on a large scale the proportion necessary to be used, without his being obliged first to measure the quantity of the water to be freed from the larvæ. They destroy also all the animals which live in the water, including the fish and the tadpoles; consequently, contemporaneously are destroyed many other animals noxious to agriculture — that, from the point of view of aquarian economy, is not little.

As to the poisonous effect on mammifers, we already know that green malachite is innocuous.

We have found that gallol is innocuous in a dose of 0.20 grain hypodermically or by the mouth to a rabbit or a guinea-pig of 400 grammes, and 0.50 gr. to a dog of three kilogrammes. The minimum lethal dose for a guinea-pig and for a rabbit of the above weight is 0.50 gr., and death takes place in convulsions, as with carbolic acid.

At the autopsy we noted, when the inoculation had been made subcutaneously, a gelatinous edema of the color of the injected material in the inoculated spot, the viscera in general of a violet color, the bladder full of colored urine, flaccid kidneys, etc. When the inoculation had been made by the mouth the same conditions were noted, except those subcutaneous, besides a slight catarrhal condition of the intestine.

A larger dose than 0.50 gr. by the mouth caused vomiting in dogs; but less than 5 grs. did not kill them.

As to the doses in which gallol dissolved in water with a larvicidal scope is innocuous for mammifers, we have had the proof.

In one of our experiments made on a large scale for destroying the larvæ, it happened that a flock of sheep drank the water without suffering any injury.

These colors even in their strongest solutions do not in the least damage herbaceous plants, and consequently not the herbage of the Marcite, which has very well supported repeated and abundant consecutive irrigations.

For deciding the use of the most efficacious larvicidal substances the last word belongs to the

(D) PRICE.

We give the cost of the most easily used larvicidal substances, in their minimum lethal doses, at the rate of the current price:

PER CUBIC METER.

Culicidal substance.	Quantity.	Cost.
		Lire.
Ammonia of medium concentration 2:100	20 liters.	4
Carburet of lime 10:1000	10 kgr.	6.50
Chloride of lime 1:1000	1 "	0.26
Bichromate of potash 1:1000	1 "	1.60
Permanganate of potash 0.5-1:100.	5-10 "	10.50-21
Gallol 0 0062-0 0007:1000	6.20-0.7 gr.	0.04-0.005
Green malachite 0.0125-0.0031:1000.	12.50-3.1 "	0.19-0 05
Chrysanthemum powder (unexpanded flowers) 0.006-0.003:1000.	6-3 "	0.02-0.015
Chrysanthemum powder (2d quality) 0.01-0.06:1000	60-10 "	0.15-0.025

PER SQUARE METER.

		Without duty.	With duty.
		Lire.	Lire.
Petroleum 0.10.....	100 Cc.	0.016	0.065
Petroleum 0.20.....	200 Cc.	0.032	0.13

The great cost, in the larvicidal dose necessary, puts out of the question all the mineral substances, including the cheapest—chloride of lime. Evidently the vegetable powders, the coloring substances, and petroleum are the cheapest for making applications on a large scale. The chrysanthemum plants from which the said powders are obtained can be cultivated by us on a large scale, and therefore these powders will be had at a much lower price than they cost at present in the market.

The price of the two coloring substances is not definite, but when manufactured in large quantities it will become less.

An exact comparison cannot be made concerning the price between the coloring substances and petroleum, inasmuch as the latter acts in surface or by suspension, the former in solution. In any case the selection must be regulated according to circumstances, taking into consideration especially, as we have already stated, the duration of action, the conditions of the water, and its agricultural uses.

SUBSTANCES THAT KILL PERFECT MOSQUITOES.

Popular experience has specially preoccupied itself in finding substances which keep away mosquitoes from man and from his habitations. Thus it is known that the shepherds and peasants of the Roman Campagna endeavor to protect themselves from mosquitoes with fire and with smoke; for this purpose the straw huts in which they live, with the fire which gives off smoke in the middle of the floor so that the huts become full of smoke, are better than the masonry habitations, built without any special attempt at defense against malaria.

Lind (1779) asserts, besides, that wearing round the neck a little bag containing garlic and camphor serves as a prophylactic against the seasonal fevers! This was also recommended a few years ago by Mantegazza to our poor workers in the rice-fields. Thus also in Sardinia, at Crosei and Dorgàli, to protect themselves from mosquitoes, the people cut slices of garlic and rub them on the face and the other uncovered parts of the body, as also the bedsteads of the beds on which they sleep.

It is also known that some individuals have such cutaneous exhalations that they are never bitten by mosquitoes; and that the various substances which are sold for procuring quiet sleep in places infested with mosquitoes, rather than killing them, are more or less successful in causing them to disappear.

As far as we know, up to the present no experimental researches have been made with the purpose of killing the aerial mosquitoes. There are a few indirect observations, like those of Silvestri, also cited by D'Abbadie (1882), on the immunity of the workers in the sulphur mines of Sicily from malaria. And among the substances used for keeping away mosquitoes we may mention that Weeder* (1880) extols the burning of the leaves of *Mentha pulegium* (or its essential oil); Campbell (1891) praises much the smoke of chamomile, because it killed the mosquitoes in a room so that they could be swept away.

But wishing precisely and exactly to judge the real culicidal action of whatever substance, it is necessary to differentiate well apparent death from real death. This distinction is fundamental both for classifying in the order of their true culicidal action the various substances, and for not accrediting such an action to substances which in reality produce only apparent death. It is necessary, therefore, to experiment in such a way as not to fall into errors.

From a practical point of view we distinguish the substances used into three categories—that is, odors, fumes, and gases.

We have experimented with the odors in the small space of a bell-glass, placed over the odorous substance, in its turn contained in a glass capsule covered with a cloth; for the fumes and gases we have, instead, used a chamber of wood and glass, of the capacity of about 100 liters, invented and described by Rosenthal† for the scholastic demonstrations of the laws of ventilation in rooms. We thus had a space very similar to a living-room, and perfectly lighted, so that we were able to follow with the eye the behavior of the mosquitoes under the action of the various substances.

Each time we experimented with mosquitoes of several species captured in the Campagna, and to assure ourselves, when the experiment was finished, whether the

* Nuttal, *loc. cit.*

† "Vorlesungen uber die öffentliche und private Gesundheitspflege," Erlangen, 1887, p. 185.

animals were really dead or not, we collected them in receptacles, where we subsequently saw if they revived or not.

We thus have been able to observe whether the corners, eventually the fissures where the mosquitoes nest, offered more or less of a refuge against the volatile substances also efficacious against them.

Therefore, the results given below represent *what in reality is obtained when the whole space of a restricted room has been invaded by a given odorous or vaporous substance up to complete saturation.* For this purpose we burned, for example, within the above mentioned chamber, tobacco, pyrethrum powder, or resin, 2 grs.; chamomile flowers or quassia wood, 5 grs.; various leaves, flowers of chrysant. myc., and ordinary wood, 25 grs.; of the so-called culicidal cones we burnt no less than two within this small space.

Their mode and time of action are given in the following table:

TABLE IX.

Action of culicidal substances on mosquitoes (*C. annulatus, C. pipiens, A. claviger* and *bifurcatus*).

No.	Substances used—Odors.	Time in which death manifests itself.	
		Apparent.	Real.
1	Essential oil of turpentine..	1 min.	1 min.
2	Iodoform.....	10 "	40 "
3	Menthol.....	10 "	45 "
4	Nutmeg.....	10 "	2 hours.
5	Camphor.....	4 to 5 min.	4 to 5 hours.
6	Garlic.....	5 to 10 min.	5 hours.
7	Crushed pepper.....	20 min.	6 "
8	Naphthalin.....	10 to 35 min.	8 "
9	Roman wormwood.....	6 hours.	24 "
10	Onion.....	4 to 6 hours.	Survive.
11	Sage.....	.....	"
12	Rosemary.....	.....	"
13	Dry and fresh basil.....	.....	"
14	Cinnamon.....	.....	"
15	Asafetida.....	.....	"

No.	Substances used—Fumes.	Time in which death manifests itself.	
		Apparent.	Real.
1	Tobacco.....	Instantaneously.	1 to 3 min.
2	Chrysanthemum powder (unexpanded flowers)....	5 min.	1 hour.
3	Fresh leaves of eucalyptus.	3 to 5 min.	3 "
4	Quassia wood.....	16 min.	5 "
5	Pyrethrum powder.....	5 "	8 "
6	Dry leaves of *Mentha pulegium*.....	5 "	8 "
7	Pitch.....	10 to 18 min.	8 "
8	Flowers of *Chrysanthemum myconis*.....	10 min.	12 "
9	Leaves of dry basil.....	2 to 6 min.	24 "
10	Dry rosemary.....	7 to 12 "	24 "
11	Culicidal cones.....	12 min.	36 "
12	Dry chamomile flowers.....	4 "	36 "
13	Dry leaves of *Satureja hortensis*.....	4 "	36 "
14	Sage leaves.....	8 to 10 min.	36 "
15	Firewood.....	5 to 7 "	12 to 48 hrs.
16	Guaiacum resin.....	12 min.	Survive.
17	Myrrh.....	15 "	"
18	Elemi.....	15 "	"
19	Incense.....	15 "	"

No.	Substances used—Gases.	Time in which death manifests itself.	
		Apparent.	Real.
1	Sulphurous oxide.....	Instantaneously.	1 min.
2	Sulphureted hydrogen.....	"	1 "
3	Ammonia.....	1 min.	2 "
4	Illuminating gas.....	1 "	2 "
5	Formaldehyde (Trillat's apparatus).....	2 "	10 to 15 min.
6	Sulphuret of carbon.....	15 to 30 min.	Survive.
7	Acetylene.....	.....	"

In this table the various substances are arranged in the order in which they produced real death of the aerial mosquitoes. It is thus seen that we have among the odors turpentine and iodoform; among the fumes that of tobacco, whose infusion we have already seen is a potent larvicide; and among the gases sulphurous oxide, which we have already found very efficacious against the larvæ and nymphæ. Other substances very practical and consequently very useful are, among the odors, nutmeg, camphor, and garlic, the latter two already sanctioned by popular experience; among the fumes, those of chrysanthemum flowers, of fresh eucalyptus leaves, quassia wood, and pyrethrum. It is not, therefore, necessary for us to spend money in buying commercial preparations—every one can procure them himself; and in cases of necessity he can make use of the smoke of firewood, which by popular experience has been found useful in the huts where our cultivators of the *agro romano* have lived for centuries.

Of the gases, the most practical, and at the same time efficacious as a culicide, are the fumes of burning sulphur; sulphuret of carbon, so much extolled as an insecticide, is inactive in a large space, owing to its heaviness.

Definitely, the destruction of mosquitoes in houses is much more easy than any bacterial disinfection of habitations whatsoever.

CONCLUSIONS AND PRACTICAL COROLLARIES.

1. Of the whole period of the cycle of development of mosquitoes, the stages in which they are most easily destroyed are those of the larvæ and of the aerial mosquito; in the former stage they are the more easily killed the younger they are.

2. To kill the larvæ, among all the very numerous substances experimented with we have in decreasing order of culicidal action: (*a*) Among the mineral substances: sulphurous oxide, permanganate of potash with hydrochloric acid, common salt, potash, am-

monia, carburet of lime, corrosive sublimate, chloride of lime; and then the bisulphites, sulphate of iron and of copper, lime, bichromate of potash, sodium sulphite. (*b*) Among the organic substances: powders of the unexpanded flowers of chrysanthemums, tobacco, petroleum and oils, formalin, cresol, certain aniline colors (gallol, green malachite), coal tar.

Taking into consideration, however, the necessary larvicidal dose, the practicability, and the price, all the mineral and some of the organic substances must be excluded, and there remain the vegetable powders, petroleum, and the aniline colors.

3. To kill the aerial mosquitoes we have odors, fumes, and gases. In the first place, among the odors we have the essential oil of turpentine, iodoform, menthol, nutmeg, camphor, garlic; among the fumes that of tobacco, chrysanthemum powder, fresh leaves of eucalyptus, quassia wood, pyrethrum powder; among the gases, sulphurous oxide. It is, however, to be noted that for these odors, fumes, or gases to exercise their culicidal action they must fill or saturate the whole ambient; otherwise they produce only apparent death, or at the most only a culicifugal action, which sometimes in houses may be useful in protecting man from being bitten by mosquitoes, and in preventing the latter infecting him, when they have sucked the blood of malarious persons.

4. The problem of the destruction of mosquitoes is experimentally soluble; but practically it will only be so when economic interest desires it. In this latter sense it is remarkable that the old larvicidal use of petroleum has not become much diffused even in those places where it is very cheap; and it is probable that those substances which destroy other aquatic creatures injurious to agriculture will be preferred, and perhaps still more those which can be had by cultivating them on the spot. For example, by growing on a large scale the chrysanthemum plants (*Chrysanthemum cinerariæfolium*, etc.), from which the culicidal powders are obtained, it is very probable that one will succeed in making the malarial place itself produce that substance which will free it of the mosquitoes that infest it.

5. The opportune season for killing the larvæ is the winter, when they are in least number in the waters, and new generations are not born; consequently, this is the time most easy for attacking them. Destroying mosquitoes in houses is always possible, but to have the greatest effect it is also best to do it in the winter, when they all take refuge in inhabited places, or wherever else they repair. The more complete knowledge of their habits — that is, of the places where and the season when they nest — will aid very much the success of this destruction, which, even in the most favorable cases—that is, when hydraulic improvement (*bonifica*) will have exhausted its task — will not be such an easy work on a large scale as some persons believe and boast. Nevertheless, after the treasures spent by nations and private individuals for preserving vines from the oidium, the peronospora, and the phylloxera, we may hope that something will be done for protecting the life of man from the mosquitoes of malaria.*

REMOVAL OF TUMOR OF SUPRARENAL CAPSULE.†

By Mayo Robson, F.R.C.S.,
Leeds.

Mr. Robson related two cases in which he has successfully removed a tumor of the suprarenal capsule. One was in a woman forty-seven years of age, operated on in 1891, who died of recurrence of sarcoma and exhaustion a few months after the operation. His second case, a woman of sixty-two, operated on in 1897, is still living and well. The tumor removed was a struma lipomatosa supra renalis, described by Virchow.

In the first case the suprarenal growth was so firmly fixed to the top of the kidney that that organ had to be removed as well, but in the second case only a wedge-shaped piece from the top of the kidney was removed with the tumor. In the patient who is still living the removal of the tumor had not been followed by any pathological phenomena.

He also related a third operation, in which his colleague, Mr. Ward, removed a sarcoma of the adrenal from a child aged twelve months. The child died from shock within a few hours.

He gave a table of eight cases, of which four had recovered and four died. He be-

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*As these researches of ours on the destruction of mosquitoes are scarcely begun, and as we are continuing them, we shall be grateful to all those manufacturers of chemical products who will send us samples of their products, which owing to their *lowness* of price can be used on a vast scale, according to the criteria we have expounded.

†Abstract of a paper read before the British Medical Association, August, 1899.

lieved these to represent the whole operative surgery of the suprarenal capsule. He said that he thought the true secret of success lay in operating at an early stage of the growth, as in his second case.

After describing the operated cases Mr. Mayo Robson mentioned a case of sarcoma of the suprarenal capsule which he had observed throughout its whole course in 1875, and from this case and others that he had seen he drew attention to the following symptoms:

(*a*) Shoulder-tip pain. This was so well marked in all the three cases that he thinks it could not have been a mere coincidence, but was probably dependent on the disease. It may be explained by the fact of small branches of the phrenic nerve passing to the semilunar ganglia.

(*b*) Pain radiating from the tumor across the abdomen and to the back, not along the genito-crural nerve.

(*c*) Marked loss of flesh.

(*d*) Nervous depression with loss of strength.

(*e*) Digestive disturbance, flatulence, and vomiting.

(*f*) Presence of a tumor beneath the costal margin, right or left, at first movable with respiration, but soon becoming fixed. It can be felt in the costovertebral angle posteriorly and can be pushed forward into the hollow of the palpating hand in front of the abdomen.

(*g*) Absence of urinary and of gall-bladder symptoms.

He concluded his paper by describing the technique of the operation.

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*ON MODERN TREATMENT OF UTERINE CANCER.**

By Thomas More Madden, M.D., F.R.C.S. Ed.,
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In the gynecological wards of the Mater Misericordiæ Hospital, Dublin, which have been under the writer's charge for the last quarter of a century, a very distinct increase has been observed within the past six years in the frequency of cases of cancer of the uterus. In the present communication is submitted a *résumé* of my clinical experience of the curative and palliative measures now available in the treatment of that disease. Amongst others, the former of those thus referred to include: (*a*) Early amputation of the cancerous cervix; (*b*) hysterectomy by vaginal or abdominal routes; (*c*) electrolysis; (*d*) escharotics, actual and potential; (*e*) injection of absolute alcohol into substance of cancerous growth; (*f*) the employment of celandine, methylene blue, and some other remedies for which specifically curative effects have recently been claimed. Of all these methods of treatment, however, there is but one on which I place any very wide or general reliance in the treatment of uterine cancer. The disease in the vast majority of instances primarily manifests itself in the cicatricial tissues resulting from parturient lacerations of the cervix uteri. Therein it very frequently remains localized for a time, sufficiently long to enable its timely detection by proper recognition of topical evidence, and above all by that microscopic examination of the scrapings of the affected surface which should be invariably resorted to in all cervical lesions occurring in patients approaching to or beyond the climacteric period. If thus early recognized, incipient cancerous degeneration may in a large proportion of cases be effectually arrested, before any malignant invasion of the superior uterine zones has occurred, by its timely and complete removal and the free cauterization of the divided surface well above the area of cancerous infection.

The advantages of this practice are sufficiently shown by the facts that, first, in the large number of instances in which it has been resorted to the mortality of the operation was *nil;* secondly, that in two-thirds of those cases the patients remained free from any recurrence of cancerous disease in the uterus or elsewhere as long as they remained under his observation—namely, for periods varying from two to ten years after the operation. These results contrast favorably with any that can be claimed for hysterectomy under similar circumstances, and hence I believe that operation in such cases should be restricted to those less frequent instances in which cancer primarily attacks the fundus or body of the uterus, or in which it has recurred there after the removal of the cervix. Under such conditions the abdominal hysterectomy operation affords greater facilities than the now generally preferred vaginal procedure for that thorough exploration and complete extirpation of any accessible implicated lymphatic by which we may hope to

*Abstract of a paper read before the British Medical Association, August, 1899.

secure immunity from eventual recurrence of the malignant disease.

Although the immediate mortality of hysterectomy for carcinoma as well as for other causes has, and more especially by the vaginal method, been now reduced to a very small percentage, the eventual or curative results of such operations are by no means as satisfactorily proven as would now seem to be generally held. If the disease be thus dealt with in its incipient stage, and when distinctly confined to the cervix, there is no reason in the present state of abdominal and pelvic surgery to doubt the curative results thus claimed. But could not those results equally well, and with still less risk, be attained in such cases by the removal of the cervix alone? On the other hand, if in the statistics which are apparently held to justify an indiscriminate resort to hysterectomy in cases of uterine cancer be included cases of long-standing malignant disease in which the upper portion of the uterus and its connections have been extensively implicated, the matter assumes a very different aspect. Bearing in mind the intimate and widespread lymphatic relations of the uterus, it is difficult to realize how under such circumstances a disease so prone to disseminate itself can, generally speaking, be so thoroughly removed from a network of adjoining lymphatic glands, and vessels apparently beyond reach of surgical interposition, as to warrant the confident assertions of eventually curative results that are made by some hysterectomists, of whose *bona fides* there is no question, but whose conclusions might probably be considerably modified by reexamination of their cases at a longer interval after operation. At the same time the writer fully recognizes the expediency of hysterectomy in those appropriate instances before referred to, viz., in the earlier stages of fundal uterine cancer as well as in some cases of cervical epithelioma in which the disease has recurred in the fundus or body of the uterus after removal of the cervix.

With such exceptions, however, having in view the common origin and general localization for a time of uterine cancer within the cervical zone and the advantages to be derived from the adoption of effective topical measures in such cases, I am convinced of the importance of the early extirpation of the incipient cervical disease. Moreover, as a preventive expedient even in cases where no evidence of malignancy is discoverable, the complete removal of all cicatricial cervical tissues resulting from traumatic injuries that might possibly otherwise eventually become the seat of cancerous disease is wise. These tissues may in such cases be more effectually dealt with by écrasure and thermocautery than by cervical trachelorrhaphy, especially in women beyond the climacteric period.

In the concluding part of the paper the uses of electrolysis, chloride of zinc, and local injections of absolute alcohol, as well as the employment of celandine, methylene blue, orthoform, and various other remedies now advocated for the mitigation of hemorrhage or discharge, or for relief of pain, in inoperable cases of uterine cancer, are discussed.

INTESTINAL ANTISEPTICS IN TYPHOID FEVER.

By M. M. Pearson, M.D.,
Bristol, Tenn.

There are no classes of remedies that have been brought so prominently before the profession within the last few years as germicides and antiseptics, both local and internal. It is to the latter and to the so-called intestinal antiseptics that this paper will be devoted. The vast number of the proposed agents so enthusiastically urged by members of the profession makes a strong argument that discredits their efficiency.

Since the knowledge of the bacillary origin of Asiatic cholera and allied diseases of the intestinal tract, and even before, on the assumption that these were supposed to be of bacillary origin, the bacteriologist in his laboratory and the clinician have continued in their extended and painstaking efforts until they have embraced every conceivable drug of real or supposed antiseptic properties. It is also to be observed, and with special reference to this subject, that the phenol group is at the base of most of them, and likewise is the most abused class in the entire materia medica list.

The chemist is unable to master this subject for the reason that the behavior of a given drug within the test-tube and its behavior after it reaches the intestinal tract may be different and is entirely conjectural; and after all the clinician is the great "leveler of truth." It has not infrequently been heralded that the ideal drug or combination of drugs has been discovered, but no sooner was the test of experience tried than each in its turn has taken its place upon the "doubt-

ful list," and beyond this we have been unable to go. We are apprised of the fact that the task is far more difficult than was at first dreamed of, and to-day the subject of intestinal antiseptics can at best be said to be in the experimental stage. In other words, the question of intestinal antiseptics "is the substance of things hoped for, the evidence of things not seen."

By making a review of this subject we will find our German *confrères* have instituted a practice based on the antiseptic principle, and which was known as the "specific treatment." It consisted in giving ten grains of calomel on the first day of a case of typhoid fever, eight grains on the second day, and so on for each succeeding day for a period of about one week. This treatment had many able advocates, and among them were Leibermeister and other notable German and American authorities. This treatment was regulated to conform with their knowledge of the pathology of this disease, and at the time was opposed by many and subsequently condemned, because it was not found to be scientific, and likewise did not afford the best results clinically. Having proven unworthy of the title of "specific," it was followed by what was known as the "German specific treatment." This well understood mode of treatment has not only had the approbation of the Germans, but has met with great favor within the United States, and is more generally employed to-day than any other line of treatment, particularly in the rural districts, where the doctor does his own dispensing, being both convenient and practical.

Statistics as furnished by certain institutions and individual members of the profession are unreliable, inasmuch as typhoid fever in every locality and in every epidemic is a law unto itself. Many cases as we well know do well with the worst of treatment, and bad with the best of treatment. The treatment of a few cases, or a few hundred cases, may mislead, as it did our lamented Pepper.

The "German specific treatment" consists in the administration of compound tincture of iodine combined with carbolic acid in the proportion of two to one, which combination is to be frequently administered. In the discussion of the present subject this treatment is selected because of its general and continued use, and because it fairly represents the principle embraced in this subject. It was on this idea that the late William Pepper, one of the most distinguished of American authors and practitioners, was led to adopt the use of nitrate of silver, which he advises in Pepper's System of Medicine, and which he so enthusiastically indorsed. He reports having treated one hundred consecutive cases without a death. At this time, or perhaps a little later, Henry used thymol and reported about the same results. But at present we know of no author advancing either of these drugs to the exclusion of others; and the authors themselves later disclaimed them as not fulfilling the promise set forth for them, and as not bearing the test of experience.

Woodbridge, of Ohio, with his fifteen-minute triturates and three-days' cure, makes a record surpassing anything yet in point of time and results. He claims for his method that it is antiseptic and eliminative, and as such abortive. We cannot admit the first proposition to be true, nor grant the latter.

William F. Waugh declares in favor of sulphocarbolate of zinc as the long looked for boon in intestinal antiseptics. Yet the great bulk of the profession have failed to find it such, and after the use of all these antiseptics the bacillary invaders remain as secure and firmly fixed in their favorite habitat, the meshes and substance of the glands of Peyer and the solitary glands, as ever.

At the present day there is not a teacher of practice in any of the reputable schools, or hospitals of like standing, or a reputable author, who vouches for the so-called antiseptic treatment in typhoid. The author of this paper has a report from about twenty teachers of practice in the leading medical colleges of the United States, who were recently asked the questions, first, What is the best treatment of typhoid fever? and, secondly, Is calomel useful and indispensable? Without exception the answer to the first question was the "Brand method," and to the second, No; except in one or two cases in which an occasional dose of calomel was permissible in the beginning, as a purge, but not as a routine treatment.

The papers read before the American Medical Association at the last two meetings disclosed the common unanimity of opinion, and no man of national reputation advocated any of the methods briefly outlined in the context of this paper, and only inadvertently referred to the so-called antiseptic treatment.

When we come to consider the question on its merits, it does not stand to reason, theory, or common sense, as a plan of practice. Should experience and practice yield positive results, then it would be that theory

could be surrendered to plausibility; but when neither establish the claims that carry any degree of conviction, then both should be relinquished.

By an intestinal antiseptic is meant an agent or drug that will arrest putrefaction and the suppurative process in the intestinal tract, the result of the presence and multiplication of organisms which are eliminated and destroyed. Foster's Practical Therapeutics says on this subject: "Certain drugs locally applied in proper strength are destructive of microorganisms of local infection, and at the same time safe to the patient. This applies to surgical antiseptics. But with infectious conditions within the body, the difficulty in the way of attainment is greater. It is little to be wondered at that the intestinal antiseptics and internal antiseptics of the present day are not much advanced beyond the period of theory, and in the opinion of members of the profession are hardly likely to advance much further."

Let us see why this is true. The same author, in speaking further on this subject, says: "It is necessary to say that the devitalizing agent in disinfection is a chemical action between two bodies, and it is essential that their molecules should be brought into contact with one another. The obstacle is in the difficulty of reaching the microorganisms with the drug without previous occurrence of chemical changes in it, as would render it almost or quite inert. Second, the great danger of doing serious injury to the patient by giving drugs in quantity sufficiently large to reach the organisms and destroy them."

Let us analyze the iodine and carbolic treatment of typhoid from a chemical standpoint, and as an antiseptic, through which medium it must act. There is no proof that it acts through the blood, and it is not so claimed by the advocates of this practice. Pursuing the advised mode of administration, which is two drops of the solution every two hours, and we will suppose this is cumulative and remains in the intestinal tract, and that none of it is absorbed, the patient will have in all thirty-six drops. As to the relative value of these drugs as antiseptics, Sternberg says that iodine, in a two per-cent solution, will destroy microorganisms of pus in two hours; and further, that it does not rank as an energetic antiseptic. Of carbolic acid Foster's Therapeutics says that it does not rank as an antiseptic as compared with the metallic salts, and for the disinfection of excreta a five-per-cent solution, equal in volume to the quantity to be disinfected, should stand four hours; and further, that it has no influence whatever upon either general or internal antiseptics.

Beginning at the mouth with the thirty-six drops of the mixture for the entire twenty-four hours, and which is destined to reach the small intestines, let us see what we encounter. Approximating the secretion of saliva for the twenty-four hours to be 1280 grammes, gastric juice 6000 grammes, pancreatic juice 800 grammes, bile 1000 grammes, and water in food and drink 2000 grammes, we get in all a total of 11,080 grammes, or nearly three gallons of liquid. True, the secretions are diminished, while the water taken is markedly increased, so that, to be safe, we will say that the total is two gallons. But this is not all. There are the various constituents of the food, the various actions and reactions, chemical and physiological, met with in the stomach, mouth, and intestines, together with various bacteria, some of which are pathogenic, so that the object sought cannot be hoped for, much less attained, owing to the great dilution of the antiseptic.

But this is not all of the carbolic acid and iodine treatment, nor all for the vast phenol group. If iodine and carbolic acid reach the intestines as such, and especially in their high dilutions, would they add to the development or the destruction of the bacilli? If salol, which is favored by Anders in his recent and very excellent work, is converted into salicylic acid and carbolic acid in the small intestines, is it a curative agent or a promoter of the growth and multiplication of organisms, upon which the virulence of the disease depends, by furnishing a pabulum favorable to their growth and development? To say the least, the experiment appears to be dangerous, and for the following reasons:

Frankel, a recognized authority on bacteriology, says on the subject of typhoid culture, now being considered for purposes more especially diagnostic, that "Chantemesse and Widal, for instance, have stated that typhoid bacilli can flourish on two per cent of carbolic acid gelatin, while the majority of other bacilli do not flourish." The same author also speaks of the culture medium of Holtz, which varies from the one above in some minor essentials, yet contains iodine, however, in a weaker solution. Ball, an American author, on the same subject in his second edition of Essentials of Bacteriology, says "that gelatin, which has added to it ten per

cent of carbolic acid, will allow the typhoid bacilli to develop, other similar bacilli being destroyed." Reeve, in his Medical Microscopy, quotes from the observation of Chantemesse and Widal in reference to their culture medium, and to Widal is due the discovery of the reaction test in typhoid.

Hence it would appear that carbolic acid, instead of destroying the organisms in question, would not prevent their growth, although the contents of the intestines might approach the strength of a two-per-cent solution, at which strength the typhoid germ has been known to survive and develop.

But by some it may be held that the good effect of this treatment is due to the iodine. In 1895 the subject of typhoid culture was taken up by Elsner, and he considered the potato gelatin of Holtz, referred to by Frankel, as the best medium up to that time. The appearance of the typhoid bacilli was not in his opinion sufficiently distinctive, especially when the carbolic acid was added, and after a long search he found iodide of potassium, in the strength of one per cent, an ideal substitute.

Let us now view this subject from another standpoint, and with special reference to true etiology and pathology. Supposing that we could reach the diseased glands within the intestinal tract, to what extent would we be able to influence the course and duration of the disease? It is more than probable that the bacilli of typhoid gain entrance to the system through the glands of the small intestines, and that here is the prime point of infection and dissemination, and we grant this; yet it does not prove the absolute efficiency of local treatment or that typhoid can be or is aborted. More than likely there are other agencies more deadly than the typhoid bacilli, *per se*, and in no wise should our sole aim be directed to the removal and destruction of these germs, which, no doubt, if it could be accomplished, would be important. Infectious diseases, of which typhoid is a typical entity, mean more than a localized trouble. The bacilli some seem to suppose are merely lodged upon the mucous membrane of these glands, but even before the febrile stage begins, or, in other words, during the period of incubation, they have passed beneath the mucous membrane into the glandular substance and may be found in the spleen, mesentery glands, gall-bladder, and also in the blood. The theory at the live organisms infect the glands and the ptomaines circulate through the system, thus producing the various morbid phenomena, is not well taken, since the living organisms have been found in almost every part of the body, and occasionally in the blood. We are forced to the conclusion that typhoid fever is as much a systemic, although self-limited, disease as syphilis, and treatment directed purely to the local lesion, and based on that principle, is as much a folly as the treatment of a chancre for the permanent cure of syphilis. Likewise, the rule holds good with special reference to the mere local treatment of diphtheria, and it is also a fact that none of the infectious diseases are influenced by a mere local treatment. The local and so-called antiseptic treatment of diphtheria has been abandoned, and in its stead serum-therapy has been adopted. The opportunity for local treatment in this disease is excellent as compared to typhoid fever.

H. A. West, professor of theory and practice in the University of Texas, in a paper before the American Medical Association, lays down the following propositions on typhoid: First, it is a specific infectious disease, and, with the exception of malaria, there is no disease of this class that can be jugulated by the action of drugs; secondly, the long period of incubation and the prolonged insidious onset characteristic of this disease give ample time for the infectious organisms to pass beyond the intestines into the other tissues, where they cannot be reached by way of the gastrointestinal canal; thirdly, there is no evidence to prove the potency of any drug for the destruction of the pathogenic agent in the intestines, when given in doses which would not be toxic to the infected person; fourthly, there is no drug known to me which will destroy the typhoid bacilli through the circulation, and that will destroy the bacilli after they have reached the glandular organs; fifthly, my experience with the formulas which have been extensively used and advised as specifics has not been such as to substantiate the claims made for them by their authors.

Osler says, on the subject of intestinal antiseptics: "Very laudable endeavors have been made in many quarters to introduce a method of treatment directed towards the destruction of the bacilli, but so far without success. Good results have been claimed for the carbolic acid and iodine treatment. I can testify to their inefficiency."

Tyson says, on the same subject, in his Practice, page 46, that "the antiseptic treatment has not a truly rational basis, while the

extravagant claims of its advocates discredit their results."

Since it appears that the bacilli do not appear in the stools often until the end of the second week, and in no case before the seventh day, the antiseptic treatment pure and simple is a failure. All are agreed that the earlier the treatment is begun the better the results, and that the mortality is doubled after beginning treatment after the fifth day. To check bacterial activity as aimed at by the advocates of this plan would be a disastrous interference with the normal process in the bowels. No one has been foolish enough to claim that the so-called intestinal antiseptics can kill the pathogenic and spare the useful organisms.

This paper is written with no other object than to correct a wide-spread and generally misunderstood principle which often governs in the treatment of typhoid fever. It should be kept in mind that it is in its broadest sense a systemic affection, or "typho-toxin," and not a local disease.

FOUR FRACTURES TREATED BY OPERATION AND WIRING BECAUSE OF FAILURE TO REDUCE BY CONSERVATIVE METHODS.

By W. T. Sharpless, M.D.,
West Chester, Pa.

The following cases, which were met with in the wards of the Chester Hospital, at West Chester, Pa., seem to be of sufficient interest to be reported:

Case I.—A. T., aged twenty-eight, butcher, admitted February 20, 1898. Dr. Elwood Patrick and myself found this patient in the ward when we came on duty April 1, having been in the hospital forty days. On February 18 he had jumped out of his wagon to stop the horse, and struck unexpectedly on the frozen ground. He heard a crack, saw blood coming out of his leg, and was unable to move. Two days later he was brought to the hospital and was found to have a compound comminuted fracture of both bones of the leg at about the middle. The wound was already seriously infected. He was etherized the day after admission, the wound cleaned out, the fragments brought into better apposition, and a wet antiseptic dressing applied, with the limb in a fracture box. It was in this position when he came under our care. He had no fever, his general condition was good, and the wound drained freely. There was no union.

Dr. Edward Martin being at the hospital at this time, he was asked to see the case and advised the following treatment, which was carried out April 8, 1898: Patient was etherized, and as there was much dead bone and fragmentary and badly shaped ends, the ends of the bones were sawed off sufficiently to get good, square apposition, and the tibia wired with silver wire. The fibula was not wired as the end seemed to be held in good position by the muscles, in which it was embedded. Through-and-through drainage was used, and a plaster cast was applied at the knee and one at the ankle, with firm splints between them, so arranged as to admit of free drainage and dressing. Three days after the operation the foot had swollen so much that the casts had to be removed, and the leg was placed in a fracture-box and dressed thrice daily. For some days there was a foul purulent discharge and some fever. These lessened, however, and finally ceased, and on June 9 a plaster cast was applied, trapped, so as to admit of dressing a small wound on the anterior surface of tibia. The rest of the wound had closed.

The case passed out of our care July 1. The records of the hospital show that the cast was removed July 13, when there was firm union, but a sinus leading down to dead bone. This was curetted July 18 and kept in a fracture-box until August 22, when the cast was reapplied and he was allowed to go on crutches. By September 20 he could walk with a cane. On November 9 the bone was again curetted, and some necrosed material removed. On November 25 sinuses had closed. He was discharged February 20 of this year, exactly a year from date of admission, with a small superficial wound on the tibia. He has been at work since. We hear he is driving an ambulance for a Philadelphia hospital.

Case II.—G. E., aged forty-five, gas-fitter, admitted March 20, 1899. While at his work he fell from a step-ladder a distance of three feet, striking his knee against the floor. The knee being flexed, the weight was received upon the head of the tibia. He sustained a fracture of the femur immediately above the condyles, with some comminution of the fragments, which permitted of great mobility in all directions. The skin was not broken. Buck's extension apparatus with sand-bags was used. Great swelling of the thigh and knee-joint occurred, with much discoloration

—probably from hemorrhage from a large vessel. At first but small weight was used. This was subsequently increased in an effort to overcome the shortening, until 23 pounds was used. Even with this weight there was a shortening of about one and a half inches. The swelling disappeared in about a month. The leg was examined from time to time, but no union occurred.

On May 26, two months after the injury, there being no union, Dr. Edward Martin operated, making an incision on the outer side of the thigh above the knee seven inches in length. The lower fragment was tilted backward, and some muscle and fibrous tissue were between the fragments. There had been no attempt at repair. It was not found possible by flexion or any other manipulation to completely reduce the fracture until about an inch had been sawed from the lower end of the upper fragment. The ends were then brought into good position and wired. A cast was applied, which was removed June 25, 1899. The wound had healed perfectly. There was still some motion; a new cast was applied and the patient was allowed to get up on crutches.

CASE III.—J. S., aged forty-one, farmer, admitted May 22, 1899. The day before admission, while leading a colt to pasture, he was thrown down, the left knee being twisted and thrown violently against a stump, producing a fracture of the left femur immediately above the knee—almost identical in character and position with Case 2. The fracture was oblique, and the lower end of the upper fragment had perforated the muscles at the side of the thigh and could be felt immediately under the skin. Before admission an attempt was made to reduce the fracture, which was unsuccessful, it being found impossible to get the point of the upper fragment out of the mass of muscles in which it was embedded. A similar unsuccessful attempt was made after admission to the hospital.

The case was operated upon by Dr. Martin one week after admission. It was found that infection of the wound had occurred, probably through the skin, and a considerable amount of pus was present. An incision was made on the outer side of the thigh and one on the inside. It was with a good deal of difficulty that reduction was accomplished. Some loose fragments were removed and the ends of the bones wired—the wires being passed through the ends of the bones and also wrapped around them. Gauze drainage was used, which has been renewed daily, and the wound irrigated with a bichloride solution. Casts were applied above and below the wound with strong splints between them. There has been a free purulent discharge in this case and regular hectic fever, and considerable failure in his general health. Within the past week, however, the fever has lessened, and as there seems to be some union we will persevere in the effort to save his leg.

CASE IV.—J. B., aged twenty-eight, laborer, admitted June 8, 1899. A bank of earth and rock fell on him while working in a quarry, catching his legs especially, and causing a compound comminuted fracture of the left tibia and a simple fracture of the right fibula, both near the middle of the bones. Two and a half hours after the injury he was brought to the hospital and etherized. It was found that a small piece of bone nearly one inch long on its largest side was completely separated, also a few smaller chips, thus taking a piece completely out of the tibia, and leaving two oblique ends which overlapped about one inch. The fibula not being broken, shortening was prevented. The incision was enlarged along the inner side of the leg where the fragments protruded, and a counter-opening was made about four inches in length just external to the crest of the tibia, and the exposed bones drilled and wired. As it was found that this did not hold them firmly the wire was wrapped around the fragments. A drainage-tube was put through the leg and the whole placed in a fracture-box. This wound has suppurated but very little, and the temperature has remained nearly normal. At this writing the case bids fair to do well.

SPONTANEOUS ESCAPE THROUGH THE UMBILICUS OF A CATHETER INTRODUCED INTO THE UTERUS.

BY P. N. ECKMAN, M.D.,
Philadelphia.

On March 1 of this year I received a very urgent call to see Mrs. H., an old patient of mine, whom the messenger stated was dying. I was out at the time, and the call was referred to my friend and neighbor, Dr. T. O. Nock, who saw her and can confirm this rather remarkable story. The doctor reported to me when I saw him in the evening that the patient was seriously ill and advised me to see her early the next morning, which I did and found the following state of affairs:

The patient is twenty-five years old,

married, rather stout, weighing 200 pounds; she has had two children, the youngest twelve months, and one miscarriage. I found her lying on a lounge down-stairs partially dressed. She was very much thinner than when I had last seen her, and there was an anxious expression about her face that denoted extreme suffering. I obtained the following history, which was rather reluctantly given:

On February 13, having missed her period twenty days, she consulted a physician, who to help her out of her supposed trouble introduced a catheter into the cavity of her uterus and told her to return the following day to have it removed. This she was unable to do on account of the blizzard which occurred on that date. She suffered some pain and passed a few drops of blood by the vagina, but did not return to the doctor for three days. When she did return the doctor upon examination was unable to find the catheter and told her she had lost it, but that she was all right and need not worry. She went home much comforted, but suffered so much pain that she sent for her abortionist, and was treated by him for about two weeks for diarrheal pain and irritable bladder, with vomiting and great prostration. These symptoms the abortionist summed up to mean typhoid fever, and had given her up to die at the time I was sent for, which was fifteen days after the introduction of the catheter.

Examination showed a fiery red tongue, a weak, rapid, thready pulse, great abdominal distention and tenderness. On palpation of the abdomen a distinct mass, which was more tender than the rest of the abdomen, was felt a little below and to the right of the umbilicus, about the size of a three-months pregnancy. On account of fat and extreme tenderness it was impossible to make a thorough bimanual vaginal examination, so that all I could make out was that this mass seemed to be continuous with the uterus, which was so drawn up and firmly fixed that it was almost impossible to reach the cervix. What this mass was I could not determine, but as it might be any one of a number of things which demanded surgical interference I advised her removal to a hospital with this end in view. This was most emphatically declined by the patient, as also was the proposition to have a surgeon see her, and I agreed to treat her expectantly, but offered very little encouragement for her recovery. I consented to the plan the more readily because the case seemed a very unpromising one for operation.

To my surprise she began to improve after a few days of symptomatic and tonic treatment, so that her diarrhea and vesical tenesmus passed off, and at the end of two weeks it was impossible to feel the mass by external palpation, while by the vagina the uterus had descended to its normal position, and the mass, which still seemed a part of it, was smaller and more posterior in position. She was at this time able to take a little food, and opiates were suspended. I did not see her again until April 1, one month after I was first called. At this time she sent for me on account of an inflamed and tender navel. This she was poulticing and said it was causing her much suffering. It was a most curious looking thing, a glistening hard white nodule about the size of a silver quarter as the center, around which radiated four or five other oblong nodules of a similar character. I ordered an evaporating lotion, and considered it the strangest thing I had ever encountered. Five days later the central nodule, which continued to be very painful, began to take on a bluish tint and ruptured in another day or two, discharging a few drops of thin, offensive pus. Attempts to probe the opening were futile, the probe only entering about a quarter of an inch from the surface, where it was arrested by a resisting substance which felt not unlike cartilage. I left directions for antiseptic washings and a powder, and did not see the case again until April 11, when the husband came to see me in the evening and asked if I would stop the next day, as there was something black sticking out of his wife's navel which he said looked like a licorice lozenge. I was interested at once and proposed to go that night, which I did, and was able, with little difficulty while the patient sat up in her chair, to extract a full-length No. 9 linen catheter with the enamel dissolved off, together with a small quantity of foul-smelling pus.

The subsequent history is soon told. The sinus healed in a few days and the patient began to take on flesh, so that now she is up to her usual weight and has no abdominal symptoms.

I have never been able to entirely satisfy myself as to the route the catheter took, but I am of the opinion that the mass I felt was the uterus itself stretched by the pressure of the curled-up instrument inside, and that this stretching brought the fundus in contact with the abdominal parietes, so that when the uterine wall perforated, which it did about the time of my second examination, it

was surrounded by an inflammatory barrier which protected the peritoneal cavity. The perforation of the uterus allowed it to sink down again to its normal or nearly normal position, relieved the tension and the pain, and caused the disappearance of the mass from above.

The interesting features of the case are the total absence of any uterine discharge, the fact that she came down-stairs every day in spite of my injunctions to the contrary, as well, of course, as the fact that the woman is alive at all.

Of the lessons which this case teaches perhaps the two most important to the abortionist are: don't leave a catheter in the uterus without tying a string to it, and don't diagnose typhoid fever until the catheter has been found. The accident is not one likely to occur to honest men.

I do not claim any credit for the happy result, since I never considered that I knew what ailed my patient until the eye of the catheter presented in the wound.

624 TWENTY-SECOND STREET.

ON THE CHOICE OF OPERATION FOR STONE.

BY JOHN H. BRINTON, M.D.,
Professor of the Practice of Surgery and Clinical Surgery in the Jefferson Medical College of Philadelphia.

LITHOLAPAXY.

Given a stone in the male bladder, how shall the man soonest safely get rid of it? In past times the answer would have been, "If the stone be small or soft, or both, crush it; if hard or large, or both, remove it through the perineum by the single, median, or bilateral operation."

At the present time, and since the introduction of litholapaxy by Bigelow, and the resuscitation and improvement of the suprapubic method, new elements both of safety and danger to the patient have been developed and recognized, which demand thoughtful consideration. A sound conclusion as to procedure cannot be jumped at; it can only be reached by carefully searching for, comparing, and weighing the merits and demerits of each method of operation. Some of the disadvantages, or possible sources of danger, have not, I think, been as yet dwelt upon, at all events sufficiently, and will therefore bear a closer investigation.

The factors which should in great part influence in the choice of procedure for the removal of a bladder stone would seem to be: (1) The character of the stone, whether it be hard or soft, small or large; (2) its duration, or length of domicile in the bladder; (3) the probable condition of the bladder, the ureters, and kidneys, the degree and character of the involvement of these organs, and the disturbance of their functions; (4) the age of the patient; (5) the gravity of the symptoms, and the amount of general constitutional disturbance; (6) the urgency of operation.

A just appreciation of the above conditions will, I think, go far to indicate the proper course and special procedure to be adopted in each individual case. In a general way it may be stated that the best solution of the vesical calculus problem will be the removal of the stone without incision of the bladder. To crush a stone and have it voided by the urethra spontaneously, or even instrumentally, would be an ideal operation, provided, in the first place, that no injury from bruising or overdistention of the bladder walls occur, nor serious and permanent ill effects be produced on the urethra and prostate gland. In the second place, the procedure should be thorough—that is, the entire amount of broken stone should come away, so that no fragments may remain to cause or keep up irritation, or to serve as the starting-point of fresh or larger concretions. In the old and now almost obsolete method of lithotripsy, which I have so often seen practiced by experienced hands, the calculus was first finely crushed—in fact pulverized—with the duck-bill crusher, and then spontaneously voided in the urine stream—"piddled away," to use the language of the day. This, however, probably only occurred where the stone was soft and relatively small, and where the crushing had been very thoroughly accomplished. Perhaps in most cases some larger or irregularly shaped fragments remained in the bladder, acting as sources of irritation or as the nuclei of future calculi. Although successful in exceptional instances, the operation was in the main not altogether to be relied upon; it was too uncertain and imperfect. Thus it has happened that with the advent of litholapaxy the older lithotrity or lithotripsy ceased in great part to be practiced.

The idea of litholapaxy, the crushing and evacuation of the stone at a single sitting, took firm hold of the professional mind, and this operation has been largely resorted to. Much has been expected from it; its early

successes have been widely spread, perhaps magnified, and its failures minimized, or imperfectly reported and dwelt upon. To such an extent indeed has this been the case, that by the laity and general profession this method has been looked upon as almost devoid of dangers, and therefore of universal application. Nevertheless, among those who have practiced it most a feeling of uncertainty has gradually grown up. There has been no doubt that this method of Dr. Bigelow has been a great advance upon the older lithotrity, and that in proper cases it should always be resorted to; yet not a few deaths have followed its use, and in other instances complete evacuation of fragments has not been obtained, and repeated operations have been necessitated. These facts have since strongly impressed themselves upon the mind of the writer, who in consequence made a series of experiments to determine if possible the bearing and effect of each step of the procedure upon the final result; in fact, to analyze the method, and see where the fault, if any, lay, and how it could best be avoided.

The operation of litholapaxy, as is well known, consists of two parts or steps. The first is the *crushing* of the stone into fragments sufficiently small to pass through cannulæ or tubes introduced through the urethra into the bladder. These, like catheters and bougies, are of various sizes, the ends being bent into short curves, or else straight. The size employed is the largest the urethra will admit, the meatus having first been incised, if necessary.

The second step is the evacuation of the crushed fragments. This is accomplished by means of a rubber bulb filled with water, which is fitted to the mouth of the evacuating tube already inserted through the urethra into the bladder. The jet of water into the bladder, by sharp pressure of the bulb, produces upward agitation of the fragments of stone, and on each dilatation of the bulb — its diastole as it were — a suction effect results by which the fragments are drawn into a receiver attached to the rubber bulb, and so guarded that their reentry into the bladder cannot occur. If the calculus has been broken into fragments of proper size, these can be thoroughly evacuated by prolonged and careful continuance of these sucking or pumping efforts of the bulb. From a purely mechanical point of view this procedure seems almost absolutely perfect. But when applied to a vital organ, as the bladder, a delicate structure, and endowed with exquisite sensibility, it has often been noticed that its effects seemed out of all proportion to the amount of force apparently employed. Death has not infrequently resulted, and varying degrees of shock referred to idiosyncrasies, or simply not to be explained.

In the researches above referred to I sought to study the character and degree of force exerted by the rubber evacuator when sharply compressed. My object was to learn whether any real violence, or possible traumatism, might be unwittingly produced. The rubber bulbs employed were of varying degrees of purity; those of greater purity were softer and more readily compressible, and consequently a greater amount of water was thrown forward at each forced contraction of the bulb under hand pressure, averaging from two to two and a half ounces, or even more. With a bulb of harder or more adulterated rubber (for the india-rubber of the market is composed largely of whiting, with a small percentage of Para rubber or gum) the fluid ejected was about one or one and a half ounces.

The effect of throwing a small quantity of water into a bladder already filled, or nearly so, was most marked. Even with the most gentle digital pressure on the bulb the bladder became tightly distended, pouched around the openings of the ureters; and if the pressure was continued or increased, it was exceedingly apt to burst.

In a recent demonstration before the Academy of Surgery of Philadelphia the bladder from the pig under a very moderate bulb pressure ruptured, evacuating its contents. Clinically I have observed that an anesthetized patient will often groan when the distention, or rather overdistention, of the bladder is produced. This is a symptom which I dread, as indicative of overdistention, and prophetic of shock and disastrous consequences.

The result of these cadaveric researches has convinced me that an excessive distention of the bladder, amounting to overdistention, may easily be unwittingly brought about even by the hands of a conscientious and careful surgeon. I believe, too, that to this cause, more than to any other, must be attributed the occurrence of a degree of shock, which sometimes is followed by fatal results, and which we have perhaps attributed to idiosyncrasies, alcoholism, or depraved conditions of the system.

It would indeed seem that safety in litholapaxy can only be insured by the surgeon constantly remembering the peril to the patient resulting from sudden surgical and mechanical overdistention of the bladder. Bearing this in mind, it would be well to adopt some such rule as this: Never to perform any of the steps and manipulations of litholapaxy, either those of crushing or of evacuation, and especially the latter, in a bladder which contains more fluid than three-fourths of its measured capacity. Thus, if under ether the bladder capacity be found to be ten ounces, after emptying it by a catheter inject into it 7 to 7½ ounces. This will leave unoccupied a vesical space which will permit increased extension to the extent of the entire capacity, represented by about two and a half ounces of fluid, that being about the amount of the fluid forced inward by moderate digital pressure on the bulb. It is to be remarked that during all this manipulation there is some backward leakage through the urethra from the bladder. This is gradual, and while it lessens the general vesical contents, preserves as it were the normal mean between injection and ejection, but is not sufficient to relieve a sudden overdistention or to avert its evil results.

Holding these views, I believe that before undertaking the operation of litholapaxy, it is important, indeed essential to the safety of the patient, accurately to determine the capacity of his bladder. This should be done three or four days before the proposed operation by first drawing off all urine with a catheter, and then distending the bladder to its full capacity by the flow from a fountain syringe under ordinary hydraulic pressure. The injected fluid should be mild and antiseptic — a weak solution of borax or boric acid. This injection should be repeated when the patient is first anesthetized at the time of operation, when a large vesical capacity will probably be obtained. The capacity of the bladder in ordinary conditions, and when dilated to its fullest extent under an anesthetic, is thus ascertained, and should be constantly borne in mind in the after procedure.

The first step of the operation is that of properly breaking or crushing the stone. It is not necessary, as in the old operation of lithotripsy or lithotrity, to pulverize the stone; it is sufficient to break it into fragments small enough to pass through the evacuating tube, under the suction efforts, which act whether the fragment be regular or irregular in shape.

In sounding for stone it is well to examine the bladder systematically, the amount of water being about half of its previously determined capacity. The same maneuver can be practiced with the crushing instrument as with the sound. The formula of examination of the late illustrious surgeon, Joseph Pancoast, I have found the most convenient and certain. According to his method the left side of the bladder is first examined with the point of the instrument directed upward, its convexity resting lightly on the posterior vesical wall. The handle of the instrument should then be depressed between the legs of the patient, and turned to the right a full circle, so that the beak shall pass lightly over the mucous membrane, behind the urethral opening, and therefore behind any projecting bar caused by prostatic enlargement, should such exist. Not infrequently calculi of small size may be found here, whose existence has previously been scarcely suspected. This is apt to occur in the bladders of old men when posterior enlargement of the prostate has taken place, with phosphatic or decomposing urine. The instrument should then be carried backward, point upward, on the right side of the bladder, to examine the right side. It may then be withdrawn, point upward, in a median line, sweeping the upper wall of the bladder by successive semicircular movements.

The mucous surface of the bladder may thus be gone over in its entirety, and a stone if present will probably be detected. If not found, probably none exists. In any event the operator will have the comfortable feeling that his examination has been made systematically and with a degree of surgical precision. In instances where the results of this examination are negative, or where the calculus previously recognized cannot be again detected or grasped, it is well to reexamine by first decreasing and then increasing the amount of fluid in the bladder. It is well also to remember that when the fluid contents are largely increased the stone may at times escape observation. It is, as it were, drowned by the amount of fluid, and its presence may be undiscovered from the very extent of mucous surface to be investigated with the sound. So also when there is too little water in the bladder, a calculus, especially if small, may be covered up by mucous folds, or hidden behind a prostatic bar.

It is not uncommon to see vertical up and down movements of the sound made by some surgeons in sounding a bladder for stone.

This is a sort of "prodding" hurtful to the bladder walls. Its only warranty is in some cases to estimate the size of a stone already located. It surely is better in dealing with the lining of a tender bladder to avoid all disturbing or rough manipulation. When the stone has been felt, it should be caught in the crushing instrument as quickly as possible. This may be done most easily by letting the convexity of the crusher settle or rest lightly on the mucous membrane of the base of the bladder by the side of the stone; then on separating the blades, and tapping gently the handle of the instrument while the blades are turned towards the stone, the latter will fall into the grasp of the crusher. The blades with the stone are then slightly raised from the bladder wall and the screw turned until the stone is broken. This process can then be repeated on the fragments. One objection to the old form of lithotrites, even when fenestrated, was their liability to nip and cut or tear the mucous folds, and even to become impacted. When not fenestrated they were very apt to become impacted by fragments, so that their withdrawal was difficult and dangerous. The writer has known death to result from this cause in two instances. In one the urethra was torn off at the bulbo-membranous region, and in the other death followed from postoperative sloughing of the urethra. The modern crusher of Bigelow, with its beaked male blade, and those of Thompson, Keyes, and Forbes, seem to be free from all mechanical objections and are sufficiently powerful to crush any stone which it may be desirable to attack, and in all of these the blades are so arranged as completely to obviate all danger of impaction and hindrance in withdrawal.

In using the evacuating bulb, so as to suck out the fragments of calculus into the attached receiver, it is desirable that the pressure of the bulb should be made quickly and sharply, and be uniform. The water in the bladder should not be allowed to escape by the side of the cannula to such an extent as to hinder the agitation of the fragments necessary to their passage into the opening at the end of the tube. This suction can be best obtained when the bladder is filled to one-half or two-thirds of its capacity, and the operator should see that this relative degree of fulness be preserved; otherwise it may easily happen, during the continuance of a prolonged operation, that the vesical contents may be unduly lessened by constant urethral dribbling without attracting the attention of the operator. The surgical manipulations may be thus so protracted as to lead to inefficient or perhaps unsatisfactory results.

The great desideratum in litholapaxy is the removal of the stone to the last fragment. Nothing should be left to serve as the nucleus of a fresh calculus. Repeated trials, with a well filled and with a largely emptied cadaveric bladder, have convinced me that the last fragments are with difficulty gotten away, if the viscus be nearly emptied, and that the best chance for their withdrawal is when the bladder is distended to one-half or two-thirds of its fluid capacity, as above stated. As to the especial evacuator, that is simply a matter of personal preference. The Bigelow instrument in its later varieties, that of Dr. Otis, or one of the modified Thompson instruments, will answer equally well. The essential matter in the employment of each is that the operator should be perfectly familiar with its use, and be able to gauge accurately the amount of water ejected and withdrawn at each forced systole and diastole of the bulb. Some little care is necessary in filling the apparatus with water to exclude the air as nearly as possible. This can be best done by immersing the whole apparatus sideways in a tin box, about five inches deep, filled with the antiseptic fluid preferred.

The litholapaxy of the books is usually regarded as a procedure of little gravity, and one which the general surgeon can readily and safely do. This I do not think is quite the case. It really is a most delicate operation, requiring for its performance a high degree of skill and frequent practice. I think, moreover, that the dangers which may result from sudden and violent overdistention have been largely overlooked, or if recognized have not been fully estimated.

The *advantages* of litholapaxy when carefully used in appropriate cases, when the bladder walls are fairly healthy, are:

1. The evacuation of the stone at a single sitting.

2. The completion of the operation to the last fragment.

3. The absence of traumatism and violence when skilfully practiced.

4. The rapid convalescence of the patient, and his ability to resume his ordinary avocations in four or five days.

The *disadvantages* may be appreciated by remembering that:

1. The operation is one of several stages or steps dependent on each other, a perfect

performance of *all* being essential to ultimate success.

2. The risk from sudden excessive distention of the bladder, with the attendant possibilities of severe shock and perhaps of death.

3. The difficulty of removing all stone fragments, and the doubt as to its accomplishment. The outcome of the operation must always be for some time uncertain, with the contingency of renewed symptoms and further surgical interference.

4. The difficulty, amounting almost to impossibility, of detecting, grasping, and crushing small calculi hidden behind a backward projecting prostatic bar, or pouched in any mucous crypt.

5. Ignorance of the exact condition of the posterior prostate in old men, and of growths invading the bladder walls, despite the aid of the cystoscope and of the *x*-rays.

(To be continued.)

ON THE METHOD OF OPERATING FOR UMBILICAL HERNIA, WHETHER FOR RADICAL CURE OR WHEN STRANGULATION HAS OCCURRED.

MARSH (*British Medical Journal*, June 17, 1899), after describing the method of radical cure for umbilical hernia in common use, expresses his conviction that this proceeding may be altered in two particulars, with the result that it occupies less time, is more easy, and, as experience shows, safer for the patient.

The first point concerns the treatment of the sac; the second the management of the adherent omentum. As to the sac; as a first step (originally suggested by Mr. Treves) this is stripped entirely of all the surrounding tissues and completely isolated down to the opening through which it leaves the abdomen —that is, to the level of the linea alba.

The isolation of the sac is thus effected. A curved incision starting from the middle line above is carried over the right side of the swelling to the middle line below, and a similar incision is made on the left side, the two together forming an elliptical wound. These two incisions are so planned that they include the skin which covers all the front of the swelling, only enough being left to allow of the closure of the wound, without tension, in the middle line, when the hernia shall have been reduced and the sac removed. Next, the whole thickness of the subcutaneous fat is separated on either side from the outer surface of the sac, including its neck. This is easily carried out by a sweep of the finger and a few touches of the knife.

The operator now has the hernial sac and its contents clearly defined and under control. The sac is opened by an incision in the middle line long enough to afford free access to its interior. The omentum—any part of which not in the neighborhood of the neck of the sac may be freely divided, provided it has been first tied or securely clamped above and below—is unfolded and the intestine exposed. This, when such adhesions as tether it within the sac have been divided, is returned. In cases in which extensive and firm adhesions have formed between the intestine and the omentum of the sac, it is safer and quicker to cut through these structures at a little distance from the gut, so that portions are left adherent to it, than to persist in dissecting them off. The intestine having been returned into the abdominal cavity, the omentum is taken in hand.

In dealing with this structure, the usual method is to detach it at what may be termed its periphery from the sac wherever it is adherent. This, if the hernia is large and the adhesions are extensive, is a tedious proceeding which occupies considerable time. The following is a more expeditious method: The operator makes his way to the omentum where its neck emerges from the abdomen. This neck or stem he defines and isolates so that he can pass his finger completely around it. If it is adherent to the ring the adhesions must be separated. The stem is now tied in strands in the usual way, divided beyond the ligatures, and returned into the abdomen. There will now remain the sac, containing, perhaps, a large mass of more or less adherent omentum. The sac is cut away by dividing its neck at the level of the ring. Its edges are brought together with sutures, and the peritoneal cavity is thus closed. The ring itself is next obliterated by strong buried sutures, and the external wound is closed.

Marsh states that during the last three years he has performed the operation he has endeavored to describe nine times—four times for radical cure, and five times for the relief of strangulation. All the patients recovered. Two patients, in whom strangulation had existed for three and four days respectively, were in a grave condition for the first twenty-four hours. The remainder bore the operation well, and gave no anxiety from the first.

The Therapeutic Gazette

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Leading Articles.

THE TREATMENT OF CHRONIC DIARRHEA.

The condition of chronic diarrhea is one which is frequently met with at the present time, although it is not so common as it was some years since, when the survivors of the civil war were more numerous. Even to-day patients present themselves to the physician with the statement that they have suffered from this condition ever since the days of their army life, and often it is surprising that their general nutrition is so little impaired. On the other hand, we meet with patients who have fewer or less copious stools, who nevertheless lose flesh with great rapidity and become much emaciated. In such cases the underlying condition causing the affection is probably situated high up in the bowel, where it prevents the proper digestion and absorption of food, or where by causing too active peristalsis it causes the food to be hurried down to the lower bowel before absorption can occur. In the cases where great emaciation does not take place the lesions are situated, it may be, in the lower bowel, and therefore do not deprive the patient of food. Nevertheless, it must not be forgotten that in some instances lesions situated in the lower bowel reflexly cause excessive peristalsis and consequently diarrhea, and of these lesions fissure of the anus is perhaps the most common. In rare instances reflex diarrhea arises from irritation produced by disease or disorder of other pelvic organs, and particularly is this true in women.

Cases of the character just referred to are often very puzzling when we attempt to discover their cause, and often go from one physician to another in the endeavor to find the remedy for their ailment.

Another class of cases is that in which the diarrhea depends upon actual catarrhal or ulcerative changes in the intestinal walls. In very few instances is this ulceration in the small bowel, except, perhaps, in cases of convalescence from typhoid fever when diarrhea may be persistent. Even in such cases, however, the lesions may be in the colon rather than in the ileum.

Finally, we find instances in which deficient digestive activity permits changes to take place in the food, and diarrhea results—an effort on the part of nature to get rid of useless and offensive materials.

As a result of this line of thought it is evident that before we attempt to treat a case of chronic diarrhea, we must study its causative factors and inquire into the minute details of the case before we can prescribe for it intelligently. Very often the employment of the ordinary formulæ useful in acute diarrhea gives temporary relief, but finally fails, because it simply checks peristalsis and does not remove the cause of the complaint. Thus in one instance, recently seen, the constant use of a flannel binder about the abdomen entirely cured an obstinate diarrhea which had continually recurred, and which was evidently dependent upon the chilling of the abdominal wall with consequent congestion of the intestines. Such a state is very commonly met with in young children, whose legs are often improperly clad even in cold weather, and in persons who continually go about with wet feet. Therefore proper clothing and careful methods of life are absolutely necessary for recovery.

Again, there is no doubt that the diet of such patients receives too little attention in many instances, and a careful study of the ordinary diet of a given case may reveal some article evidently at fault, the prohibition of which is followed by cure. In close connection with this subject is that of drink.

Many cases of morning diarrhea are distinctly modified if the patient steadfastly refrains from drinking much liquid the evening before. This is probably due to the fact that the presence of much fluid in the upper bowel causes excessive peristalsis during the night, and this fills the lower bowel with fluid before enough can be absorbed to cause the contents of the colon to possess the proper consistency. Further, this lack of absorption of fluid causes thirst, and this again provokes excessive drinking of fluid.

Finally, a word or two as to medicinal treatment. In many cases in which the fault lies in faulty digestion, the administration of some active digestant is advisable. If the nitrogenous foods seem especially prone to cause the disorder, the use of a liquid preparation of pepsin with hydrochloric acid may be a wise procedure, such as:

℞ Pepsin cordial, f ʒ ij;
Acid hydrochlor. dil., f ʒ jss or f ʒ ij;
Aquæ dest., q. s. f ℥ iv.
M. Sig.: Two teaspoonfuls after meals.

Or if an astringent seems advisable dilute nitric acid may be substituted; or again, if the liver seems torpid fresh nitrohydrochloric acid will be better. Sometimes where a marked astringent is needed, aromatic sulphuric acid is better still.

If the diarrhea be one of fermentation and indigestion the following may be useful:

℞ Taka-diastase, gr. xv;
Carbo ligni, gr. xv;
Pancreatin, gr. xv.
M. Ft. in chart vel capsule No. xx.

If fermentation is particularly marked, salol may be added for its antiseptic effect.

If the diarrhea is due to lesions of the lower bowel, local applications are needed, and medicine by the mouth is comparatively useless. In such instances high and gently given colon injections of water, cool if fever is present, or sulphocarbolate of zinc twenty grains in each quart of water, may be useful. Sometimes an iodoform suppository containing five to ten grains of this drug will, by acting as a local sedative and alterative, do much good.

THE RELATION OF MOSQUITOES TO MALARIAL DISEASE, AND THE VALUE OF CERTAIN SUBSTANCES IN THEIR DESTRUCTION.

It may be of interest in connection with the paper which is published in the current issue of the THERAPEUTIC GAZETTE, detailing the experiments which have been made by Celli and Casagrandi in Rome upon the various substances which will destroy, or rather prevent the development of, the mosquito, to review certain facts bearing upon this theme.

To those who have not kept themselves in touch with the recent experimental work upon the ability of the mosquito to act as the inoculating agent of malarial infection, it may not seem that Celli's experiments are particularly valuable — over and above the relief which they may give from the annoyance due to mosquito bites—but as soon as one makes himself acquainted with these investigations and finds that the mosquito in certain of its varieties is fully responsible for the severer forms of malarial fever, these investigations in the line of preventive therapeutics become extraordinarily valuable.

It will be remembered that a number of years ago Sergeant Major Ross, of the English Indian Medical Service, reported certain extraordinary results found by him in the study of the *Proteosoma labbé*, which is one of the malarial parasites found in the blood of birds. His studies were chiefly connected with the observation of these parasites in gray mosquitoes, and he found that mosquitoes were the means by which malaria of the avian type was conveyed from one bird to another.

These investigations led Manson to advance the hypothesis that human malaria was due to this cause. And the next step of any great importance was the observation of MacCallum of another form of malarial parasite infecting birds, viz., the *Halteridium labbé*. This investigator showed beyond all doubt that the flagella derived from this parasite — and it is well known that similar flagella are given off by the parasites of human malaria — represent sexual elements. He found that there were two forms of halteridium, one hyaline in character and the other granular. It is the hyaline form which undergoes flagellation; the granular form never undergoes this change. The process carried out is as follows: The flagellum, tearing itself loose from the hyaline form, approaches and penetrates the granular form, and from this union, or fertilized parasite, an actively moving organism develops. While MacCallum's observations only dealt with the parasite of birds, Bastianelli and Bignami, two Italian investigators, have found that there are two forms of the tertian parasite of man

as well. The male form they call "Microgametocytes," the female form "Macrogameti." The nucleus of the male form is small and centrally situated, and that of the female is situated at the periphery and is larger.

These observations have also been still further confirmed by the fact that after MacCallum had observed these conditions in the blood of birds, he also saw the same process of fertilization take place in the blood of a woman who was suffering from estivo-autumnal fever.

Major Ross, in 1897, found certain peculiar pigmented cells in the stomach wall of two mosquitoes fed on the blood of a patient suffering from estivo-autumnal fever, and furthermore he found that these cells were only found in mosquitoes which had been fed upon the blood of patients so infected. Ross has also shown that these reproduced bodies accumulate in a small gland situated near the proboscis of the mosquito, and it is believed that when the mosquito bites an individual, the individual is thereby inoculated with the malarial parasite, which rapidly develops in his blood.

Convincing evidence of this has been advanced by Grassi, who found that three varieties of mosquitoes are constantly present in malarious districts and absent in districts where this disease is unknown; and further, that one of them, the *Anopheles claviger*, is found in districts where tertian malaria is present, whereas the other two forms, viz., *Culex penicillaris* and *Culex malariæ*, are invariably found in those localities and at those places where the estivo-autumnal fevers are present.

Further, Grassi has taken mosquitoes from malarious districts and allowed them to bite individuals who have never had malaria, and produced malarial fever in these individuals. This experiment has been verified by other observers.

Much of this information is derived from the article of Dr. W. S. Thayer in *Progressive Medicine*, and that of Dr. Futcher in the *American Journal of the Medical Sciences* for September, 1899, and also from an article recently published by Ross in the London *Lancet*. Taken in conjunction with the studies published in this issue of the GAZETTE they show clearly the interesting and valuable results of an original research in which investigators from all parts of the world have given their best efforts for the relief of a common malady.

THE BUILDING OF A NOSE UPON A METALLIC BASE.

Though there have been many cases reported in the journals, and often with convincing illustrations, showing that defects of the nose or the almost complete destruction of this organ may be remedied by the building up—by transplanting flaps—of a new nose upon a framework of celluloid, platinum, or other smooth rigid material, the profession has not been enlightened as to the ultimate results of such operations.

To the surgeon it seems obvious that in many of these cases there would ultimately result either persistent suppuration or exposure of the foreign body by perforating ulceration of the transplanted flaps, or necrosis of the bones upon which the bridge is supported.

Martin (*Revue de Chirurgie*, No. 8, 1899), who warmly advocates this method, states that this ulceration is generally due to the fact that the flaps taken for the formation of the new nose are insufficient. As a proof of this he publishes two photographs—one of his patient taken immediately after the operation in 1878, and exhibiting a nose apparently afflicted with elephantiasis; the other taken in 1898, showing a nose of almost normal size, and if not beautiful, certainly much better than the total or partial absence of this organ.

The base of support, not necessarily bone, should be large and should not be subject to any great pressure. The formation of this base of support is accomplished by an ingenious method, fully described and illustrated by Martin.

Martin acknowledges that the scaffolding upon which the nose is built may be displaced and be subject to constant motion by the contraction of the face muscles. This, he maintains, can be prevented by firm fixation; indeed, he holds that all accidents incident to this method of rhinoplasty are easily avoided. He quotes a case operated on by Bonet in 1885 in which the result is as admirable to-day as it was a few months after the operation. It is, however, suggestive that these two cases are the only successful ones cited in the article, and that Martin elaborated his method and published it in 1889.

It is to be hoped that the ultimate results of these operations, which have certainly been performed by the hundreds, may be published; since thus we may learn to judge truly of the value of the method, and in case

it is only exceptionally successful, patients may be spared a procedure not free from pain or even danger, and which affords but a slight prospect of a cure.

AMPUTATION THROUGH THE HIP-JOINT.

This operation, at one time regarded as among the most formidable in surgery and presenting a mortality so high that few surgeons either advised or performed it, has, with the improvement of technique and the fuller recognition of the means by which surgical shock can be prevented and treated, been followed by such admirable results and been so generally practiced when the indications for its performance are present, that it has to a great extent ceased to be a prominent topic in current literature.

A historical account of the development of the operation, such as is given by Levison in the *Journal of the American Medical Association* of June 24, 1899, in relation to two successful operations of this nature, both performed on the same morning, is of very great interest. He recalls the fact that this operation was not performed until the end of the eighteenth century, when Larrey, the then master of his art, of seven such operations lost all his cases. Blaudin, however, in 1794 saved one of three cases.

The first successful American operation is accredited to Brashear, a Kentuckian, in 1806. The appalling mortality shown in Ashhurst's tabulation of 633 cases, over sixty-four per cent, applies to the preantiseptic period, during which time there was no considerable advance in technique made.

The suggestions of Woodbury, to compress the common iliac artery with the fist inserted in the bowel; of Davy, who advocated the use of a lever; of Jordan Lloyd, who used a rubber bandage; of Trendelenburg, who advocated the use of a steel needle and rubber ligature; of Thomas, who practiced subcutaneous ligature; of Macewen, who compressed the abdominal aorta beneath the umbilicus, by means of the fist applied against the vertebral column through the abdominal wall; and of other ingenious surgeons, are mentioned and described, including McBurney's method of direct intra-abdominal finger compression of the common iliac artery, practiced by incising the abdominal wall as in appendicitis operations. The finger is introduced through the incision and compression made.

Wyeth's modification of the Trendelenburg method was practiced and is advocated by Levison, and, indeed, it is commonly accepted as the most serviceable by the profession. This method has reduced the mortality from sixty four to sixteen per cent, as shown by sixty-nine cases tabulated by Wyeth.

Erdman states that from 1884 to 1894 there were eighteen hip-joint operations done in the New York hospitals, with eight deaths. Of these, but seven were done by the Wyeth method, and all recovered, leaving eight fatal cases out of eleven done by other methods.

Levison has collected twenty-eight cases since Wyeth's statistics were published, dating from 1896, with three deaths, giving a mortality of 10.7 per cent.

Levison firmly believes that the mortality of the cases collected by him since 1896, since which time hypodermoclysis has been generally resorted to, shows that this precaution accounts for the diminished death-rate.

Furneaux Jordan's method, practiced mainly in England, has been modified by Wyeth in such wise that the stump is shorter, the section through the muscles being made at the level of the trochanter minor.

It is probable that the comparatively meager number of reports found in current literature, forming in a way an insufficient basis for study and particularly for tabulation and computation of mortality, is due to the fact that this operation is no longer unusual, and that recovery is the rule rather than the exception. The need for hypodermoclysis is the exception rather than the rule, since when the operation is performed with any degree of skill it is practically bloodless and the shock is consequently a minor factor. When performed for the removal of crushed and lacerated limbs, the immediate mortality will still be high, since the fatal injury has usually been inflicted before the surgical operation is performed. Under these circumstances hypodermoclysis and the modern treatment for shock may be life-saving. A convincing statistical evidence to this effect would be most valuable.

Reports on Therapeutic Progress

THE ETIOLOGY AND TREATMENT OF IRITIS

Mr. JOHN GRIFFITH writes on this topic in *Treatment* for June, 1899. He thinks that local treatment deserves the first thought. Mydriasis is produced by the instillation of a

one-per-cent solution of sulphate of atropine. The value of atropine is not merely to prevent adhesions of the iris to the capsule of the lens, though this is of paramount importance, but also, by paralyzing the ciliary muscle as well as the sphincter pupillæ, to secure complete intra-ocular rest—*i. e.*, to suspend for a time all muscular movement within the eye, this to obtain physiological rest, the first and highest aim in the treatment of all acute inflammations. It is sometimes desirable to atropinize the second eye as well, even though not inflamed; by doing so, reading or using the sound eye for near work is successfully prevented. Atropine has still other advantages: it is an antiphlogistic; it reduces the amount of exudation and promotes absorption; it acts also as a local sedative. It is without doubt the drug *par excellence* for iridocyclitis. How much cocaine augments its action it is difficult to estimate; perhaps it does assist its sedative action to a slight extent. Besides the use of atropine, further local treatment is necessary. The eye should be protected from the light either by means of a broad shade, by the wearing of tinted goggles, or by the patient being kept quiet in a darkened room. In the worst cases, when the inflammation is most acute and the conjunctiva chemosed, absolute rest in bed is most essential. Local depletion by the application of leeches to the temple gives almost immediate relief, which is usually permanent. No drug can ease the pain so soon nor so effectually. The use of Heurteloup's artificial leech is better than no bloodletting, but cannot in point of efficacy be compared to the natural leech.

Hot applications to the eye are also very serviceable, especially in the rheumatic variety. The heat may be applied moist or dry. The dry pads may be kept on for some time without changing, but the fomentations should be repeated every half-hour.

Local treatment varies very slightly whatever the cause may be; there is, however, a point to bear in mind, and that is the occasional idiosyncrasy a patient has with regard to atropine. Atropine will sometimes create a severe local inflammation of the skin and cellular tissue of the eyelids and cheek, accompanied very often with a papular rash. Even a single drop of a weak solution may cause it to appear, and unfortunately the other mydriatics may all act in a similar fashion. The use of hydrobromate of scopolamine appears to be the least likely to be attended with such a consequence. Atropine poisoning in contradistinction to atropine irritation is less common, and the milder symptoms — dryness of throat, thirst, anorexia, sleeplessness, etc. — can usually be prevented by advising the patient to keep the lacrimal sac compressed for a few minutes after the drop has been instilled.

Before passing on to the treatment peculiar to the cause, there are a few facts to be borne in mind. At the commencement of every attack of iritis a free purge must be given overnight and a "black draught" in the morning. Alcohol should not be taken in any form, nor should smoking be allowed. Rest in bed should be determined by the severity of the case. In the slow chronic forms of serous iridocyclitis, which often run a course of six months or longer, it would be wrong to keep the patient a prisoner; he must have outdoor exercise, and it may be necessary to send him away to the seaside for a few weeks.

It is obvious that constitutional treatment plays an important part in cases of iritis due to gout, rheumatism, syphilis, diabetes, etc.

A patient suffering from gouty iritis requires his diet to be carefully regulated, to have his excretory organs properly attended to, and in that way to have his system cleansed. His bowels should be freely evacuated daily; he should be made to sweat freely either by injections of pilocarpine hypodermically, or by taking a Turkish bath twice or three times a week. These cases are also much benefited by leeching, and by the free administration of mercury.

In rheumatic iritis not dependent on gonorrhea, salicylate of sodium may prove of great service and may relieve the pain without the necessity of leeching, or even if the pain returns after the good effect of the leeches has passed off; but it cannot be relied upon. Iodide of potassium is another drug valued in the treatment of rheumatic iritis, even if it be of gonorrheal origin. It does not, however, give very striking results, and in anemic subjects may be not only useless, but actually harmful. Quite recently two cases of rheumatic iritis have come under Dr. Griffith's care which he says were very obstinate indeed; no drug seemed to benefit them, and iodide of potassium certainly seemed to aggravate the condition. Upon giving strychnine the iritis in each case cleared up rapidly.

With regard to iritis caused by syphilis, there is little to write on constitutional treat-

ment. Mercury in some form or other is attended with the best results, and even if anemia be present—which is often dependent on the syphilitic virus—mercury should be persevered with. One of the worst cases of syphilitic iritis Dr. Griffith has ever witnessed, in which a large gummatous growth rapidly developed in the ciliary body, with ectasia of the sclera, yielded eventually to mercury. The patient was under the care of Mr. Juler, who pushed the mercury till its influence on the system was shown, and in spite of severe anemia the cure was marvelous. The inflammation and growth disappeared, and the anemia was also cured. Whether iodide of potassium by itself is of much service in iritis of syphilitic origin it is difficult to say, as mercury is usually combined with it; but mercury alone, or in combination with the iodide salts, is the best drug, and might safely be given in any case the cause of which is uncertain.

Diabetic iritis, like syphilitic iritis, is, contrary to what one would expect, very amenable to treatment. Besides the usual local remedies, codeine should be given internally and an anticarbohydrate diet taken. The exudation of lymph in the anterior chamber quickly melts away, and the eye returns to its healthy state.

One of the most interesting problems in ophthalmic surgery is the treatment of tuberculous iridocyclitis. The disease does not cause much if any pain until the advent of glaucoma. Glaucoma, moreover, does not develop in every case. There is iritis seen in some; in others there is very little visible inflammatory reaction. The growth gradually enlarges till the anterior chamber is for the most part filled, and then an ectasia of the sclera in the ciliary region appears. The question to be determined is how soon should excision be performed when the condition is recognized? And again, whether it is wisdom to excise the eye, as it may be regarded as a local deposit from some more gross tuberculous lesion in some remote part of the body, probably the lungs. It happens that in many instances no evidence of tuberculosis elsewhere can be discovered. Can this be the sole focus of the disease? If so, excision should without hesitation be adopted at the earliest possible date so as to remove the danger of dissemination. Dr. Griffith says the danger of dissemination seems to him to be in direct ratio to the tendency to caseation. In the eye tuberculous disease originates most frequently in the anterior part of the uveal tract; it is recognized, therefore, early, and excision is consequently resorted to long before caseation has taken place. This is fully proved on the examination of such eyes; it is very exceptional to find any caseating focus. Moreover, the danger of spreading to the other eye is remote indeed. He has never seen, read, nor heard of the second eye becoming tuberculous. In these two respects a tuberculous eye differs very materially from a tuberculous testis, hence it seems unnecessary to doubt the proper course to pursue. It seems to him that the eye should be excised at the earliest possible moment when any doubt as to the diagnosis has been sufficiently cleared up.

THE TREATMENT OF PRURITUS.

In treating pruritus it should be remembered that it may be both primary and secondary. In the primary cases it is simply due to some local irritation of the skin; in the secondary cases it arises from Bright's disease, jaundice, diabetes, acid dyspepsia, and similar conditions. Pruritus can also be divided into generalized itching and local itching. The generalized form often comes on periodically, and its onset is often produced by disturbances of the emotions, severe intellectual disturbances, marked alterations in diet, sudden variations in temperature, and particularly the development of heat of the skin when the patient gets into a warm bed after undressing in a cold room.

Besides these forms we also have that generalized form of pruritus which is seen in old persons, and apparently depends upon malnutrition of the skin and upon gouty tendencies. In the way of localized pruritus we have that form which invades the neighborhood of the anus and is most frequently aroused at night, affecting often the coccyx and scrotum, and often aggravated by the presence of hemorrhoids.

In women we frequently have pruritus of the vulva produced by pregnancy, the menopause, and local irritation. Pruritus of the prepuce in males is often due to the passage of diabetic urine. Very rarely indeed pruritus of the palms and plantar surfaces is met with. This affection, although rare, is usually persistent.

In making a diagnosis of pruritus it must be remembered that anal pruritus may be due to the presence of seat-worms, and that itching of the skin in other portions of the

body may be due to various parasites, such as pediculi and scabies.

The treatment of pruritus depends very much upon the condition which produces it. In cases of jaundice, the use of phosphate of sodium and similar substances will often be advantageous. Dietetics will perhaps do the most good in cases of diabetic pruritus; taking care of the skin and the use of diuretic drugs may be of advantage in cases of renal disease. As a rule in diabetic cases, articles capable of undergoing fermentation in the alimentary canal should be avoided, particularly rich, greasy foods, and only small quantities of alcohol should be allowed, the patient living largely on green vegetables and roast and broiled meats. In many instances, particularly in those of gouty tendency, weak alkaline mineral water may be employed with advantage. Internally a prescription such as the following may be used to allay nervous irritation:

Valerianate of ammonia, 30 grains;
Tincture of valerian, 2 drachms;
Peppermint water, 3 ounces.

Two teaspoonfuls of this in a wineglassful of infusion of chamomile flower may be given three times a day.

In other instances where there seems to be intestinal fermentation a pill composed of carbolic acid 1 grain, extract of valerian 4 grains, given three times a day, may be useful.

Locally the treatment should consist in hot douches applied daily for the period of a minute, particularly over the vertebral column. In other instances full baths in which almond meal or starch-water has been added may be employed with advantage. In still other cases the addition of a quart of vinegar to the bath may be useful; and in still others the part may be locally enveloped in a cloth wet in an infusion of cocoa leaves in the strength of one-per-cent. In the way of sedative lotions the following may be employed:

Carbolic acid, 15 grains;
Glycerin, 1 ounce;
Water, 3 ounces.

Or,

Vinegar, 1 ounce;
Hot water, 3 ounces.

Or,

Hydrate of chloral, 30 grains;
Glycerin,
Alcohol, of each 3 drachms;
Water, 3 ounces.

In other cases hot water alone is of advantage, and finally may be used a lotion composed of

Corrosive sublimate, 2 grains;
Alcohol,
Cherry-laurel water, of each 1 drachm;
Water, 3 ounces.

In the way of ointments the following are useful:

Menthol, 15 grains;
Vaselin, 3 ounces;
Carbolic acid, 15 grains;
Oxide of zinc, 2 drachms.

Or,

Talc,
Oxide of zinc, of each 1 drachm;
Powdered camphor, 15 grains;
Vaselin, 3 ounces.

In some cases a dusting powder may be useful, as for example:

Talc, 2 ounces;
Subnitrate of bismuth, 2 ounces;
Oxide of zinc, ½ ounce;
Powdered camphor, 30 grains.

Orthoform has been employed in powder or ointment in some of these cases with temporary benefit, but it sometimes causes local irritation of the skin.

In some instances the application of the continuous galvanic current to the skin is of advantage, the positive pole being placed over the itching part and the negative pole at some distant point.

In very malignant cases good results have followed linear scarifications or the use of superficial cauterization with the thermocautery or with the electrocautery.

Of course, these methods are only useful in cases in which the affection is localized.—*Journal des Praticiens*, June, 1899.

CHRYSAROBIN A SPECIFIC FOR WARTS.

G. M. Fitz, in the *Boston Medical and Surgical Journal* of June 29, 1899, says that since 1895, when Dubreuilh called attention to the presence of warts on the feet, the characteristic differences between warts and corns have been more or less generally recognized. Warts on the feet are readily distinguished by their location (usually upon the plantar aspect of the foot) and by their bleeding from a central, vertical bundle of papillæ arranged like a pepper-box and ordinarily projecting somewhat above the pared surface. This central bundle of papillæ is surrounded by a thickened area of skin penetrating to a greater or less depth and an outer painful zone of inflamed skin.

In 1891 Dr. Fitz saw for the first time a wart in this situation and attempted to cure it with salicylic acid in collodion. He found after a trial of three weeks that this was not effective. He was then led from its superficial resemblance to the lesion of psoriasis (bleeding points) to try a solution of chrysarobin in gutta-percha. The wart was thoroughly pared until there was profuse bleeding, and the solution applied to the denuded surface. The patient was directed to cut the surface every night and apply the chrysarobin. In a few days the pain disappeared, and the wart seemed diminished in size. In two weeks' time the wart was practically gone and the surface restored to its normal condition.

Since that time he has been able to apply chrysarobin in eight cases of warts similarly located. Some were apparently due to stone bruises; others to the irritation of defects in the boot; and of others, again, no history could be obtained. In one case there were three warts on the ball and two upon the heel of the same foot. Several of the cases came to him after having been treated for months by salicylic acid without success, even though the physician in charge had made the application himself each week.

In most cases the chrysarobin produced little effect before the end of the first week, except that the pain became less and the wart did not increase. In the second week change was rapid in most of the cases, although in a few cases there was still little effect. In the third week the majority were cured.

In the series of eight cases there have been no failures. Two apparent failures were traced to difficulty in paring the wart, and as soon as this was remedied by sandpapering the cure progressed favorably. On the whole, careful thinning of the surface with a sharp, fine glass-paper gives better results than paring with a knife, as the patient is less afraid of injuring himself and can more conveniently handle the paper.

Dr. Fitz's experience has been that chrysarobin may be applied either in a ten-per-cent solution of the ordinary gutta-percha solution or in a ten-per-cent ether solution. It is best to apply the chrysarobin at night, and to advise the patient to put on an old stocking, to prevent soiling the bedclothing. Application once a day in this way seemed ordinarily to be sufficient, but in obstinate cases it should be applied both night and morning.

The influence of the chrysarobin seems to be not only upon the keratinized portion of the skin, but also upon the proliferated blood-vessels in the papillary central part, for both disappear and true skin is formed over the surface. No scab was thrown off, but a considerable thickness of the surface was removed in each case by cutting and sandpapering.

A correspondent has reported two additional cases of cure with chrysarobin, making the total number of cases ten. The attempt to try the effect of chrysarobin on warts on other parts of the body has been possible in but one case (warts on the hand), where it had the same favorable effect.

Experiments with chrysarobin on corns show that it has practically no effect.

The claims of chrysarobin as a specific for warts may be summed up as follows:

1. Success in a series of ten cases of warts on the sole of the foot in which the diagnosis was perfectly clear.

2. Similar success in one case of warts on the hands.

3. No failure in any case where the application was made repeatedly on the denuded surface of the wart.

4. No subsequent recurrence of the wart.

TO HEAL VACCINATION SORES.

A. K. Bond writes in the *Maryland Medical Journal* of July 1, 1899, of his method of treating vaccination sores. He first points out that if the glycerinated virus proves satisfactory in its potency, and in its ability to keep its strength, as numerous competent observers claim that it does, the danger of accidental infections of the original inoculation scratch will be greatly reduced, especially if the scratching instrument is carefully disinfected by red heat or pure carbolic acid, if the skin is previously washed, if the virus is conscientiously made, and if the site of the vaccination is dressed aseptically until it is restored to its natural condition.

Practically, the physician has to dress many suppurating sores of vaccinations made by himself or by others.

The belief prevails in the community that a sore half an inch or more in diameter suppurating for weeks, or even for months, is an occasional sequel of successful vaccination which must be borne with patience, and is to be treated as well as may be with dressings of mild powders and salves of various sorts. The exposure of this error, Dr. Bond says, is his motive in writing the present article. He states that he knows by experience in their treatment that the most repulsive of such

sores may be caused to cease suppurating and to become a dry-scabbed sore in even a single painless dressing, and may be healed within perhaps a week. At first he supposed this fact was known to the mass of practitioners, but apparently it is not. The dressing referred to is a solution of nitrate of silver, about eighty grains to the ounce of distilled water. When such a sore is brought to him, he removes the scab if it has one, washes the surrounding skin clean, perhaps using alcohol, and mops the sore carefully with the silver solution until its surface is covered with a thick layer of white. When this has dried, a dressing of absorbent cotton with bismuth, or what not, dusted on it is applied. The pain of the silver in this strength is insignificant, the itching and irritation greatly diminish or disappear, the suppuration is permanently or for many days stopped, and the patient almost forgets the sore. In some cases the dressings begin after a week or more to become soaked with pus. A second nitrate of silver application may then complete the healing.

Dr. Bond says that before he learned this method of healing he used to consider post-vaccinia sores among the most disagreeable sores a physician has to deal with. Under dry dressing of bismuth, calomel, etc., they scabbed and suppurated off, and scabbed and suppurated, until both patient and doctor were tired and disgusted with them. Antiseptic ointments did cause scabbing but did not check suppuration. He finally tried nitrate of silver stick with great benefit, but timid children would never let him get near the sore a second time on account of the pain of the caustic stick. The eighty-grain solution is almost painless, yet very efficient; children seem not to dread its repetition. After the first dressing Dr. Bond has sometimes ordered a small quantity and directed the mother to make subsequent dressings with it until healing was accomplished.

Dr. Bond says he is encouraged to bring this very small therapeutic point to the attention of the profession by his knowledge of the fact (deduced from observation) that whenever smallpox threatens, and vaccination becomes general, there are in the community dozens, perhaps hundreds, of men, women, and children going about week after week with nasty sores which daily saturate the dressings and perhaps the clothing of the part with irritating pus, until the victims come to look upon vaccination as a very disagreeable ordeal to be avoided as long as possible in themselves, their children, and their friends, and welcome any statements, however ill-founded, that profess to prove that "vaccination is unnecessary and nearly as bad as smallpox." What wonder, if the patient has two or three months of discomfort whenever he submits to it? [This would not happen if good glycerinated vaccine was used.—Ed.]

Dr. Bond is accustomed at the time of vaccination to request his patients in case any pus discharge occurs to go to him at once, and to assure them that in a few days, perhaps in a single dressing, he will relieve them of all discomfort therefrom. He says the only reason he can suggest for the obstinacy of suppuration of these sores is that the sore was originally a pustule, and that when the top, or scab, comes off it leaves exposed at its site a pit walled and floored, not by healthy tissue, but by the bacteria-infected lining of the pustule. He cites the aphthous sore of the mouth as an analogy, where the floor of the vesicle is a tough nest of irritating materials, which, when cauterized away, layer after layer, leaves beneath a simple healthy wound. The granulations which spring up from the floor of the uncovered vaccination pustule seem to be very weak; hence the value of the mild caustic, whose stimulating and disinfecting powers act more deeply than simple surface washes or antiseptic salves.

Dr. Bond has reflected upon the question whether all vaccination vesicles ought not to be at once opened upon their appearance, and, by nitrate of silver or other like application to their interior, brought at once to abortion. This method has been adopted by some in smallpox eruption upon the face and hands. If the whole protective influence of vaccinia has been already received when the papule begins to swell into the vesicle, the prevention of the maturation of the vaccinia vesicle by any harmless measure would be a reasonable and desirable undertaking. It is possible, however, that substances absorbed from the vesicle intensify and complete the immunity, but he thinks it unlikely. The trouble is that since smallpox inoculation has been discontinued there is no easy way in which the efficiency of various modifications of the Jenner method of vaccination can be readily and positively tested by the civilized practitioner. Rather than trust to speculation he is inclined to follow the positive provings of Jenner's age.

THE IMPORTANCE OF THE PRESERVATION OF BODY TEMPERATURE DURING RESUSCITATION OF THE NEW-BORN CHILD.

With the exception of a faintly beating heart, the infant born asphyxiated has all its organs in a state of rest. Functional activity is almost at zero. An infant born dead will have the temperature of the mother. Lying in a room heated to 70° F. uncovered, it will lose ten degrees of temperature in fifteen minutes. Swung through the air, it will lose from twelve to fifteen degrees in as many minutes, depending somewhat upon its plumpness.

An adult exposed to cold that proves fatal is dead before any such loss of temperature prevails. Infant asphyxiation may be due to maternally administered anesthetics, or narcotics, to pressure on the head by forceps or molding, to tonic spasm of the uterus, to intracranial blood-pressure, to pressure on the cord, to shock from manipulations of the cord, to distortion of fetal attitude, and various other causes. In many of these varieties, conspicuously those of anesthesia and narcosis, voluntary resuscitation will ensue if simply the loss of animal heat is prevented for about fifteen minutes.

In a thousand cases of resuscitation the "safety point" will be reached in ten minutes with sixty per cent; in fifteen minutes with twenty-five per cent; in twenty minutes with ten per cent; in twenty-five minutes with three per cent; and the remaining two per cent through a period up to an hour and more.

So long as the fetal heart action continues resuscitation is possible, and this automatic, rhythmical action continues much longer than is generally supposed. Neugebauer reported in the *Centralblatt für Gynäkologie* of November 26, 1898 (see *Obstetrics*, January, p. 21), the continued contractions of the heart of a fourteen weeks' old embryo for three hours, pulsations occurring every two to three minutes. Opitz (see *Obstetrics*, p. 150) reported in the same journal two cases of fetus at term with the heart beating for thirty minutes, and capable of further contractions after removal under stimulation of a needle. Much longer cases of postpartum heart beating with no respirations have been reported, and no doubt many a still-born child has been laid aside as dead whose heart was still contracting. The ideal method of resuscitation will use the best combination of all aids to respiration, vascular and cardiac circulation, and equilibrium. Blood communication between child and placenta should remain unimpeded; the uterus should not be handled, unless it is bleeding; alternate compression and expansion of the chest should be achieved with freedom; insufflation should be available if required; alternate application of heat and cold, spanking, throat cleansing, etc., etc., should be ready at hand, which may include stretching of the sphincter ani, traction of the tongue, and use of the now ubiquitous electric current; but, above all, should be included the preservation of the body heat up to normal temperature.

The following method of resuscitation has been employed for over a dozen years with growing favor: A vessel one and a half by two feet and six inches deep is half filled with water, as hot as the hand can comfortably bear, and brought close enough to the mother to receive the child without causing traction on the cord. The child is held with the back of the neck resting in one hand and the posterior knee and thigh surfaces in the other. It is then immersed in the hot water, and artificial chest action secured by alternately bringing the knees and head together and apart (Dew's method), the mouth being kept above water. At intervals of ten to fifteen seconds it is dipped once in very cold water in another bowl, then immediately returned to its hot-water bath. When first placed in the hot water it will turn quite "blue," due to temporary paralysis and expansion of the skin capillaries. All other adjuvants to resuscitation can be applied with the hot-water immersion kept up practically all the time. In the asphyxia of narcosis, anesthesia, and cerebral congestion, more time is given for the restoration of equilibrium in the circulation by sustaining the body temperature, and in the asphyxia of anemia (pallida) the hot bath wards off the most imminent danger — cold — and sustains the flagging heart. The cord must not be handled. We know that moderate manipulation of it *in utero* causes heart shock and death. The uterus must not be "Crédéed." If we compress the fundus we might as well sever the cord. The foramen ovale may not close while the blood runs from placenta to child, nor the respirations start up promptly as our anxieties might foolishly desire; but we should not wish to have them do so, for while the mother still breathes for her child its circulation is gaining the equilibrium of its equable surroundings.

Let us condemn and do away for all time with the aerial gyrations of Schultze's method. It is spectacular, but chilling. It is resuscitating to the operator, but deadly for the fetal heart. It is efficient in lung expansion and compression, but no better than Dew's. It gives the stimulation of cold air, but prevents the use of heat, which should be used in the proportion of ten to one in favor of heat. It robs the child in its direst need of its second mother — the placenta — and must succeed promptly or fail altogether. It was conceived with an eye single to lung expansion, and reminds one in its narrowness of wisdom of the bear in the fable which was appointed to keep off the flies from his master who slept. He killed one, which had alighted upon his master's nose, with a large stone, thrown with wonderful accuracy of aim, and wondered why his master did not awake and thank him.—Editorial in *Obstetrics* for June, 1899.

A PRESCRIPTION FOR A HEMOSTATIC-ANESTHETIC SOLUTION.

Legrand employs the following solution, particularly in lesions of the mouth, where it is desired to produce anesthesia and arrest small hemorrhages:

Pure gelatin, 30 grains;
Chloride of sodium, 8 grains;
Carbolic acid, 2 grains;
Hydrochlorate of eucaine B, 8 grains;
Hydrochlorate of cocaine, 2 grains;
Distilled water, 3½ ounces.

—*Journal des Praticiens*, May 13, 1899

THE TREATMENT OF WHOOPING-COUGH.

The *Journal des Praticiens* of May 13, 1899, after pointing out the necessity that the child should live in a room at the proper temperature and have plenty of fresh air, and should be given easily digested food frequently, suggests the following internal treatment for use as soon as it is decided that the child is suffering from the disease:

Externally the chest is rubbed morning and night with a liniment composed of essence of turpentine and oil of sweet almonds, equal parts. Care must be taken that the pure turpentine is employed, and if the child's skin is irritated by it the strength should be decreased. The object is to produce slight reddening but no further irritation of the skin. It is thought that the counter-irritation and the inhalation of the turpentine exercise a favorable influence upon the respiratory passages.

In regard to internal treatment, a good many remedies are employed, but nearly all of them have disadvantages. Aconite is too depressing; belladonna and codeine are too powerful, and check secretions. Antipyrin is apt to interfere with the functions of the kidneys, but inhalations of oxygen are advantageous, and bromoform is recommended by Marfan as distinctly useful. The prescription for bromoform may be as follows:

Chemically pure bromoform, 10 drops;
Alcohol (90 per cent), sufficient quantity to hold the bromoform in suspension;
Syrup of orange flowers, 1 ounce;
Simple syrup, 2 ounces.

This prescription may be given in the dose of one to five teaspoonfuls each twenty-four hours. To a child as young as six years a teaspoonful at seven in the morning, at midday, and at five at night is about the proper dose. It must be remembered that bromoform is a remedy of very great power and that it must be used with some caution.

THE TREATMENT OF DIABETES.

GUIRANNA (*La Clinica Medica*, An. 5, n. 19) speaks very highly of a diet of fresh vegetables in the treatment of diabetes. In bad cases he finds that much benefit is derived from an exclusive diet of fresh vegetables for a few days, but in ordinary cases a mixed diet is sufficient. The vegetables recommended are endive, cabbage, French beans, artichokes, and in general all green vegetables. Peas and beans, provided they be fresh, may be taken in small quantities (¼ kilogramme). The author also allows fruits in moderation. The only saccharine substance allowable is levulose, from 50 to 200 grains a day. Probably the reason why green vegetables are tolerated so well is because the starch is converted into levulose and not dextrose. The objection to saccharin and dulcein for sweetening is that they do not represent a food, but a foreign body, in the organism, and being of the aromatic series, and as such non-assimilable, only increase the amount, already copious enough, of waste products in the body. The author has no great faith in drugs, but thinks certain mineral waters, alkalies, massage, and baths more useful.—*British Medical Journal*, June 24, 1899.

STRUMOUS OPHTHALMIA.

Mr. MAITLAND RAMSAY, in the *Edinburgh Medical Journal* for July, 1899, gives the following directions as to the treatment of this somewhat obstinate disease:

In addition to the careful supervision of diet, the free elimination of the toxins, which as a result of malassimilation have accumulated in the blood, must in every way be promoted. This is to be accomplished by stimulating the action of the kidneys, the bowels, and the skin — more especially the last. Hence the importance of the hot bath, which the child should have every night at bedtime, diaphoresis being further encouraged by the wearing of a warm flannel nightgown. It is usually advisable first of all to administer a dose of castor oil; but it should be borne in mind that many of these children do not bear purgatives well, as the intestinal mucous membrane is so irritable that troublesome diarrhea is easily induced.

Of drugs, none is so useful as tartar emetic, which should be given in slightly nauseating doses. Its chief virtue depends on its diaphoretic action, and its efficacy is greatly increased when it is administered with a laxative, *e. g.*, powdered rhubarb. If the tongue be brown, a few grains of gray powder may be added with advantage to the rhubarb and antimony combination. Under this treatment it is wonderful how soon the whole appearance of the patient changes. As the power of digestion becomes greater, the skin improves in color, the hands and feet keep warmer; and the child, instead of lying with its face buried in a pillow and fretting and crying when spoken to, is now quite good-tempered, and runs about the ward and amuses itself with its playthings. Any indiscretion in diet will, however, promptly bring on a relapse, for in these cases the conjunctiva reflects the condition of the gastrointestinal mucous membrane even more quickly than the tongue. Intolerance of light, blepharospasm, and increased lacrimation speedily show themselves after some forbidden food has been eaten, while the tongue may not become furred till the second or even the third day. The fear of relapse makes it imperative, therefore, that the treatment be continued for at least a fortnight after the recovery seems complete. Apart from simple digestive agents, such as pepsin, pancreatin, etc., no medicines are as a rule necessary, but most of the patients are benefited by quinine, which, either alone or in combination with an acid, seems to exercise a favorable influence after the acute symptoms have subsided.

Cod-liver oil, compound syrup of the phosphates, syrup of the iodide of iron, etc., are also very valuable remedies, but they should never be prescribed in the early stages, for they then simply add to the difficulties by still further overtaxing the digestive powers. When, however, all feverishness has disappeared, and the tongue is clean, they are decidedly helpful in improving the general nutrition and promoting the repair of any local lesions in the eyes themselves. All syrups, however, such as chemical food, etc, must be used with great caution, lest they disturb digestion, and so determine a relapse. Dusart's syrup of the lacto-phosphate of lime and iron is the most easily assimilated; but as a general rule preparations in which sugar is replaced by glycerin or malt extract are safer. When there is much enlargement of the glands, a mixture of chloride of calcium and iron is very serviceable.

For the first few days of the treatment the patient should be kept in bed, with the eyes shaded from the light; but the use of all poultices and bandages must be strictly prohibited. Whenever improvement begins, the child ought to be encouraged to run about, and, if possible, sent to the country, preferably to a high, dry, bracing locality, and it should live out-of-doors as much as the weather will permit. The seacoast should be avoided, as the glare from the water is apt to prove irritating to the eyes, and to cause a relapse.

The local treatment will necessarily vary according to the stage of the disease. The child's hands and face must be washed frequently, and, as far as possible, it ought to be prevented from crying and rubbing its eyes. The eyes themselves should be bathed night and morning—oftener if there be much discharge — with a warm solution of boracic acid, or a lotion containing perchloride of mercury and belladonna. While the symptoms of acute irritation last, atropine and cocaine, by soothing the nerves of the conjunctiva and diminishing the congestion of its blood-vessels, lessen the photophobia. Whenever the pupil dilates, the child usually opens its eyes; but when the superficial irritation is great, the action of the atropine persists only for a few hours, and in order to obtain full benefit the drug ought to be reinstilled whenever the pupil begins to contract. As the blepharospasm lessens the cocaine may be omitted from the ointment,

and the atropine combined with boracic acid or the red oxide of mercury. Even in cases which have lasted for a long time, leeches or blisters should not be used.

After the acute inflammatory symptoms have somewhat subsided, more stimulating applications are necessary, and calomel and the yellow oxide of mercury are the two favorite remedies at this stage. The former is most serviceable in relieving passive congestions. It must be dried thoroughly and flicked from a camel's-hair brush into the conjunctival sac. Its beneficial action seems due to the fact that calomel becomes, by the action of the tears, converted into perchloride of mercury. It is therefore necessary to be careful not to use it too freely, or in too coarse powder, for any excess collects in the lower retrotarsal fold, upon which it is apt to have a caustic action. The yellow oxide of mercury often acts like a charm in cases where there is an efflorescence of pustules upon the bulbar conjunctiva. It is best applied in the form of an ointment of the strength of one or two grains of the oxide to a drachm of white vaselin. The bulk of a barley-corn of this is instilled into the conjunctival sac, and the eye gently massaged for a few minutes through the closed eyelids.

In an ordinary case of strumous ophthalmia no further treatment than that just indicated is required. If a case is not making satisfactory progress, careful inquiry should at once be made as to whether the prescribed diet is being strictly attended to, as well as the nightly warm bath.

When the disease has been neglected, complications arise which require special remedies.

1. Swelling of the eyelids, and mucopurulent discharge. The eyes must be kept scrupulously clean by bathing with an antiseptic lotion; and once a day, or oftener, according to the amount of the discharge, the conjunctival surface of the lids should be everted and painted with a two-per-cent solution of nitrate of silver. The presence of a fissure at the external canthus, when such treatment requires it to be carried out, adds greatly to the child's sufferings; but as this fissure will never heal until the eyes can be opened voluntarily, there is no help for it but to persevere, every care, of course, being taken not to cause unnecessary pain.

2. Inflammation of nasal mucous membrane. This membrane is swollen and ulcerated, and secretes a discharge so acrid that its presence produces much swelling of the alæ nasi and the upper lip. If the child be permitted to lie with its face buried in a pillow an eczematous eruption is sure to appear. The nostrils must be kept clean by douching with an alkaline antiseptic lotion, and the nasal mucous membrane brushed afterward with ointment, *e.g.*, a combination of iodol and tannic acid. As in these cases there is always an excess of acidity, alkalies are most serviceable. They should be given in small doses frequently repeated, and there is nothing better than a mixture of calcined magnesia and sulphur, or a combination of sulphate of magnesium with bicarbonate of sodium.

3. Pediculi. In neglected cases this is a very troublesome complication, and one regarding which the nurses must always be warned to be on their guard. In the most filthy cases it is necessary to cut the hair short, and in all the head must be washed with carbolic soap, well dried, and stavesacre ointment rubbed into the roots of the hair. By this means the pediculi themselves are destroyed, but the nits remain firmly attached to the hairs, so that after the first thorough dressing scrupulous cleanliness and the daily use of a small-tooth comb are necessary in order to prevent the vermin from reaccumulating.

4. Ulceration of the cornea. In every case of strumous ophthalmia which has lasted for a long time, the cornea is almost certain to suffer, and whenever ulceration occurs the ulcer becomes the prominent feature, and all treatment is directed toward its cure.

SUPRARENAL GLAND AS A HEMOSTATIC.

A little more than a year ago Schäfer pointed out the hemostatic effect of suprarenal in epistaxis; during the last twelve months the extract has been used abroad to control the hemorrhage in operations in the nose and pharynx. Grünbaum (*Journal of Physiology*, May 11, 1899) suggests that cases of hematemesis might be benefited by the administration of suprarenal extract, if the active principle were not absorbed sufficiently rapidly to cause a rise in blood-pressure, in which case the hemorrhage would not be controlled. The author made some observations on his own blood-pressure before and after doses of pulverized suprarenal tabloids, the hemostatic properties of which had been tested. An Oliver sphygmodynamometer was used, which, although not correct absolutely, worked excellently as a comparative instrument. The doses taken

were 10, 20, and 30 grains; the blood-pressure was taken every ten minutes for three hours after the dose; no cardiac stimulant vitiated the results of the experiments. In no case was there an appreciable increase in blood-pressure—that is, an increase beyond that of experimental error, which is 4 mm. Hg.

Another series of experiments was carried out on a woman who at one time had given the impression of being afflicted with Addison's disease. Her blood-pressure was normally 118 mm. Hg. when taking imitation suprarenal tabloids; on her being given thirty real tabloids representing 120 grains of the fresh suprarenal gland daily, no rise in blood-pressure occurred, although the treatment was continued for over a week. In one case a rise in blood-pressure was found after the administration of suprarenal; it was in the case of a pregnant woman who had some pigmentation, vomiting, great muscular weakness, as shown by the ergograph, and a very low blood-pressure. A rise from 75 mm. Hg. to 91 mm. Hg. was brought about by the administration of suprarenal tabloids, which was not maintained on the omission of the doses. The negative results as regards the alteration of blood-pressure in normal individuals make it probable that suprarenal extract is an ideal hemostatic in cases of hemorrhage from the walls of the alimentary canal or bladder.—*British Medical Journal*, July 1, 1899.

PROTECTIVE INOCULATION AGAINST PLAGUE AND CHOLERA.

The speech in which Mr. Haffkine introduced the discussion on preventive inoculation at the Royal Society places us in possession of the main facts and theories which have influenced him in the prosecution of his important work. The problems which he set himself to solve were most intricate and complex, and required talent and perseverance of an exceptional order to bring them to a successful issue. No one who listened to the address which Mr. Haffkine gave in February, 1893, when he came over from the Pasteur Institute in Paris to arrange for his visit to India to test on man the remarkable results he had worked out on animals in the laboratory with reference to the cholera bacillus, could fail to be struck by his enthusiasm, though perhaps some were skeptical of the results which would accrue from his mission to the East. Ferran's failure in Spain was too fresh in their minds to be forgotten, and though Mr. Haffkine explained the reason of failure, and showed that his method differed from Ferran's in securing a pure, stable, and controllable virus, yet the attitude of mind adopted was rather one of hope that he was right than of expectancy. The six years that have passed since then have been for him six years of continuous hard work and devotion to his self-appointed task. Gradually in that time a complete change has taken place in the general attitude toward preventive inoculation, and that change has been effected by the results which Mr. Haffkine has been able to show as following on his extensive experiments in India not only in cholera but also in plague.

Prophylactic inoculations are based upon the fact that an attack of infectious disease generally leaves the recovered patient more resistant to the second attack. On this foundation rested the work of Jenner and Pasteur, as well as the more recent work of Haffkine, their disciple. It is the success of Jenner and Pasteur which gave rise to the modern conception that artificial immunity may be created against infectious diseases by the introduction into the system of specially prepared and harmless virus; but, as Mr. Haffkine points out, the conception is too general in its nature, and its application, when undefined, is apt to lead to disappointment. The composite character and modifications of a virus, according to the way in which it is prepared, have to be taken into account. For a long time it seemed impossible to produce artificial immunity by derivatives from diphtheria or tetanus virus or from microbes in general, which cause localized infections, and do not, as a rule at least, invade the system. Similarly the different results which the same modification of a virus produces in different species of animals have to be borne in mind. While it now seems safe to assume that a form of prophylactic treatment may be found that will be useful against a particular infectious disease in a particular species of animal, yet that method may not be applicable to another animal or to another disease affecting the same animal. Professor Haffkine believes that it is inattention to variations in circumstances and conditions which has more than anything else checked the success of a number of experimenters.

The study of the anticholera inoculations in India, in which the microbes alone were used as the vaccine, brought up another problem. The Calcutta results showed that

for a period of nearly fourteen months the number of deaths among the inoculated was 22.62 times smaller than amongst the uninoculated, and for the rest of the time under observation the proportion in their favor fell to one and 1.54; but while the absolute number of deaths appeared strikingly influenced by inoculations, the special feature observed was that the proportion of deaths to those attacked among the inoculated was not changed. The fact that case incidence was remarkably affected, while the case mortality was not reduced, presented a new aspect in the problem of preventive medicine, and accordingly, in 1896, when confronted with the problem of working out a prophylactic treatment against plague, Mr. Haffkine determined to obtain not only a lowering of the susceptibility to the disease which he had succeeded in obtaining in cholera, but also a reduction of the case mortality. For that purpose he determined to employ in combination with the plague microbes their extracellular toxins. In order to accumulate these products the bacilli were grown in broth in the ingenious manner described by Mr. Haffkine in his paper. The process is continued for five or six weeks. The microbes are then killed by heating to a temperature ranging from 65° to 70° C., after which the virus is ready for use.

Mr. Haffkine quoted the statistics of three instances. At Byculla jail there were twelve cases and six deaths among 172 uninoculated inmates, and only two cases with no death among 147 inoculated inmates. At Umerkadi jail there were ten cases and six deaths among 127 uninoculated inmates, and three cases with no deaths among 147 inoculated. Again, at Undhera village, there were twenty-seven cases and twenty-six deaths among sixty-four uninoculated inhabitants, and eight cases with three deaths among seventy-one inoculated inhabitants. Other observations, such as those at Lanowlie, Kirkee, Damaon, Hubli, Dharwar, and Gadag, presented the same favorable results. The facts at Hubli showed that within a short time a town of nearly 50,000 inhabitants can be inoculated. The difference in the mortality between plague among the inoculated and plague among the non-inoculated was estimated to average over eighty per cent, sometimes reaching as high as ninety per cent. The dose of the prophylactic varied from 3 to 2½ cubic centimeters for an adult, and the duration of the effect was at least a few months, the usual length of an epidemic.

Some of the problems which remain to be worked to perfect the system were mentioned by Mr. Haffkine, and others were referred to by those who joined in the discussion. Though minor points, they are important to complete success of the general application of the system, and we have no doubt that when Mr. Haffkine returns to India after a well-earned rest from labors which have been Herculean, he will be granted full opportunities and the necessary trained assistance in his laboratory to enable him to solve them. The main and most important feature, however, of his six years' work is the grand fact, which Mr. Haffkine has established, that both cholera and plague inoculations are a success, whether they are applied on a small or a large scale, and that in this method we possess a powerful prophylactic against these two most fatal diseases. — *British Medical Journal*, July 1, 1899.

HIGH ALTITUDE AND HEART DISEASE.

BABCOCK, of Chicago, concludes an article in the *Medical News* of July 15, 1899, on this subject with these words:

1. All forms of cardiac disease do not contraindicate sojourn at a high altitude.

2. The ill effects of low atmospheric pressure in some forms of cardiac disease are explicable on the hypothesis of acceleration of venous flow and corresponding quickening of the heart-beats.

3. Consequently those forms with which high altitude is likely to prove incompatible are pronounced aortic or mitral stenosis, and regurgitant disease complicated by pleural and pericardial adhesions.

4. On the other hand, patients with uncomplicated regurgitant lesions, or arteriosclerosis with or without myocardial changes, may endure low atmospheric pressure without injury.

THE QUESTION OF GRUELS IN THE FEEDING OF INFANTS.

This practical question is discussed by CHAPIN in the *Medical Record* of August 5, 1899. He believes that besides attenuating the casein, the addition of gruels to cow's milk increases the nutritive value of the food. This is of great service in that class of cases in which bottle-fed babies show stationary or losing weight. The food for such infants may be properly prepared as far as percentages are concerned, and yet they do not thrive. This is especially seen in institution

babies. A proper addition of gruels to milk will not infrequently check wasting. The large proportion of lactose, a carbohydrate, in woman's milk shows the desirability of this food principle to the growing baby. The rapid production and easy dissipation of animal heat in the very young, with active tissue metabolism, indicate the call for some of the carbohydrate series.

Various observers have called attention to the favorable effect of carbohydrates in tending to prevent the putrefaction of proteids in the bowel. Such action is doubtless due to the formation of acids in the intestine, especially in the lower segments. The presence of free acids in the bowel prevents the growth of those intestinal bacteria that thrive in an alkaline medium.

While proper theorizing is desirable in the practice of medicine, the ultimate and final decision upon any therapeutic question must rest upon clinical experience. The writer has tried all kinds of infant feeding with that hardest class of cases, bottle-fed babies in hospital and dispensary practice. By adding gruels to the milk, the best results are obtained with these babies. The theory is that the cereal will help attenuate the curd of cow's milk and aid in the nourishment of the baby; in practice, the infant is not so apt to vomit thick curds, and the tendency to a stationary or losing weight is often lessened. Jacobi, with his long clinical experience, while recognizing and utilizing all the advances in infant feeding, maintains that the use of decoctions of the cereals is of the greatest value as an addition to cow's milk. He finds that even very young infants thrive better when cow's milk is diluted with gruels than when a mere sugar solution is added. In Germany, Heubner, of Berlin, comes to the same conclusions from a wide clinical experience.

The common objection advanced against this method of feeding is that a nursling should not be given starchy food in any form, as its digestive powers cannot cope with this food principle.

While large quantities of starch should be withheld in infancy, even the youngest baby can tolerate and digest a small and proper amount. According to Hammarsten, ptyalin, or salivary diastase, the amylolytic ferment of the saliva, occurs in new-born infants. He also states that pancreatic diastase, which, according to Korowin and Zweifel, is not found in new-born infants and does not appear until more than one month after birth, seems, although not identical with ptyalin, to be nearly related to it. Hence a certain amount of starch can be digested by the newly-born and very young infant.

AN EXPERIMENTAL INVESTIGATION OF THE ACTION OF RED BONE-MARROW ON THE BLOOD IN ANEMIA.

As the result of an investigation made by FOWLER, and printed in the *Scottish Medical Journal* for September, 1899, he reaches the following conclusions:

(1) Subcutaneous injections of bone-marrow have no action on the red corpuscles or hemoglobin of a healthy animal. (2) When the red corpuscles and hemoglobin fall below their normal limits, injections of marrow produce a decided rise in both. This rise is well marked, sudden, and of short duration. (3) Along with the increase in the red corpuscles, there is no corresponding improvement in the form of the cells. (4) The active principle is present in an aqueous, but not in an alcoholic, extract of marrow; it is not precipitated by boiling, does not contain iron, and may possibly be a deutero-proteose.

RELATIVE TOXICITY OF COCAINE AND EUCAINE.

PECK places his conclusions as to this matter in the following words in an article in the *Journal of the American Medical Association* of September 9, 1899:

1. The action of cocaine is inconstant; one never knows whether the symptoms occasioned by like quantities of the drug, in animals or individuals, under like circumstances, will be similar or dissimilar.

2. The action of eucaine is constant. The symptoms occasioned by the use of like quanties in animals, under like circumstances, and so far as Dr. Peck's experiments have gone, in different individuals also, are the same.

3. The first action of cocaine on the heart is that of a depressant, and on the respiration it is that of a mild stimulant, the after-effects being, on the heart, that of a decided stimulant, and on the respiration that of a decided depressant.

4. The first action of eucaine on both the heart and respiration is that of a stimulant, the after-effects being those of a decided depressant.

5. Cocaine causes death in animals by paralyzing the muscles of the respiratory apparatus, the heart's action continuing in a feeble way for a brief period after breathing ceases.

6. Eucaine causes death in animals by paralyzing the muscles of the heart and of the respiratory apparatus, they ceasing to operate simultaneously.

7. Eucaine in toxic doses nearly always causes nausea and occasionally vomiting.

8. Cocaine is much less nauseating and scarcely ever causes vomiting.

9. Eucaine is decidedly a diuretic, causing renal discharge in a majority of instances in which a toxic dose is used.

10. Cocaine is not a diuretic to any appreciable extent, renal dischârge having occurred in only one instance in connection with all Dr. Peck's experiments.

11. The pupil of the eye, in nearly all cases of cocaine poisoning, does not respond to light and is more or less bulging from its socket.

12. The pupil of the eye in most cases of eucaine poisoning does respond feebly to light, and rarely bulges from its socket.

13. The action of toxic doses of eucaine is more like that of a paralyzing, tetanoiding, convulsion-producing agent, than it is like an anesthetizing one, the plantar and cremasteric reflexes nearly always responding.

14. Toxic doses of cocaine cause general anesthesia in connection with the other symptoms in the majority of cases.

15. True tetanus of all striped muscles of the limbs, and Cheyne-Stokes breathing, nearly always occur with the use of cocaine, but seldom does either occur when eucaine is used.

16. Cocaine is at least three times more toxic than beta eucaine, and alpha eucaine is as toxic as cocaine.

17. Boiling does not destroy the efficacy of cocaine, but it does modify it; and boiling in no degree lessens the efficacy of eucaine.

THE TREATMENT OF TUBERCULOSIS.

LAWRENCE FLICK states his belief in the *Medical News* of September 2, 1899, that a great deal can be accomplished by drugs in the treatment of tuberculosis if the drugs are judiciously used. We have no specifics for tuberculosis and may never get any, but we have valuable adjuvants and are constantly adding new ones to the list. In Dr. Flick's experience he says he has found iodine the most valuable remedy at our command. He used it in the form of europhen, which he introduced by inunction. The following is the formula which he employs: Europhen, 1 drachm; oil of rose, 1 minim; oil of anise, 1 drachm; olive oil, 2½ ounces. Of this he has the patient rub from a teaspoonful to a tablespoonful into the armpits and into the inside of the thighs once or twice a day. Formerly he used iodoform in this way, but owing to its offensive odor he has discarded it in favor of europhen, which is even richer in iodine than iodoform. As the patient becomes more tolerant of iodine he sometimes reenforces the inunctions by giving the europhen by the mouth in addition. He has tested the value of this treatment for a long period to convince him that it is real and worthy of confidence. The treatment ought to be kept up for a long time, and even after all symptoms of the disease have disappeared.

The next most valuable drug in Dr. Flick's experience is creosote. This is of especial value in the more advanced stages of the disease. In all cases of tuberculosis which have advanced to the stage of breaking down he gives creosote in addition to europhen inunctions as a routine treatment. In order to get the full benefit of creosote large doses should be given. He begins with one drop and increases the dose gradually until the patient takes from forty to fifty drops three times a day. The best vehicle which he has found for administering the drug is hot water. As he increases the dose of creosote he increases the amount of hot water, and in this way his patients find themselves able to take large doses of the drug without inconvenience. The maximum dose is usually taken in a pint of water. As a rule he orders the creosote taken before meals, and is under the impression that it stimulates the appetite. He uses pure beechwood creosote in preference to other preparations because it is less expensive.

The third place in the order of importance in the value of drugs for the treatment of tuberculosis he unhesitatingly assigns to strychnine. In what way it acts he does not know, but if given in proper doses it helps to increase weight and improves the heart action. As a rule it ought to be given in large doses, but all patients do not bear large doses well. The dose should be changed from time to time. Other drugs that are useful in properly selected cases are arsenic, digitalis, mercury, both in the form of calomel and corrosive sublimate, belladonna, muriate of ammonia, aromatic spirits of ammonia, nitroglycerin, the mineral acids, and the vegetable tonics. Most of these drugs may be used to advantage for build-

ing up nutrition. Nitroglycerin is useful for checking hemorrhage, ammonia for stimulating the secretions of the bronchial glands.

ERYSIPELAS AND ALLIED DISEASES.

The *Edinburgh Medical Journal* for August, 1899, contains an article by MACLACHLAN in which he suggests the following line of treatment. He thinks that in uncomplicated cases of cutaneous erysipelas no special treatment is required beyond supporting the patient, favoring elimination, and using antiseptics locally to the affected parts. As a further precaution, the air of the sick-room or ward might be charged with vapor containing eucalyptus oil, which proved effective in checking the spread of the disease in an asylum alluded to by Dr. Maclachlan. These preventive measures can scarcely be dispensed with, considering the risks tiny scratches on the body expose one to; and further, we cannot estimate beforehand the inherited tendencies that exist in some individuals to this disease.

Many drugs have been counted as specifics, particularly large doses of tincture of chloride of iron, but Dr. Maclachlan has not been able in his own experience to support Bell and others who have taught this doctrine. He has given in several cases as much as thirty minims every hour, in the hope of arresting the disease, but has been unable to satisfy himself that the medicine exerted any peculiarly curative influence. Whatever tends to contract the capillaries of an inflamed area is likely to do good in diminishing the exudation, and so the tension and pain of the part. Iron is likely to do all this; but there its influence stops. Moreover, it would not be difficult to bring a body of evidence in favor of any drug in a disease that spontaneously subsides.

Not a few drugs, while not markedly affecting the pathogenic cause of a disease, do good by influencing the morbid products of the disease, either by causing or promoting their absorption or checking their accumulation, and, so to speak, relieving the mechanical disabilities of the affected part. Under this head the author places aconite (praised by Ringer), purgatives, diaphoretics, etc., all of which may be more or less useful, when properly used, although in no sense curative.

With regard to surgical cellulitis and its congeners, Dr. Maclachlan says he supposes little doubt exists as to there being no specific drug. In such circumstances the best treatment is to conserve the vital processes, an expression used by Gull in regard to any treatment. This object is achieved sometimes by what seems to be diametrically opposed lines of treatment. There is the patient and his disease. What seems best for the patient may not be best for that part of him which is the seat of morbid action, and *vice versa*. When in doubt, one must treat the patient, and take the cue from the general state of the body and not from the local affected part.

The surgical forms of the disease, including puerperal peritonitis, and, for that part of it, even septic pleurisy, he has been in the habit of treating in the following way:

Dietetic.—He relies chiefly on brandy, eggs, and milk, with good beef tea by way of a change. The brandy he uses as a food and a dietetic stimulant, giving one or two teaspoonfuls hourly in bad cases, with about a wineglassful of milk, or egg and milk whipped, with some sugar added, or a corresponding amount of beef tea.

It is of great importance to regulate the quantity of food given to a patient according to the powers of the stomach. A patient may take a wineglassful of liquid food hourly, whose stomach could not tolerate a cupful every two hours. Sometimes it may be necessary to give only a tablespoonful or even a teaspoonful at a time, frequently repeated. If the stomach is very irritable, and vomiting sets in, he withholds food by the mouth for several hours, giving the patient a teaspoonful occasionally of weak brandy and water (a teaspoonful to the wineglassful), and applies mustard poultices to the epigastric region. This generally succeeds. When vomiting stops food may be cautiously given.

In regard to the question of stimulants in acute disease, Dr. Maclachlan says he has never been able to disabuse his mind of the idea that it is possible to poison a sick person, as well as a healthy individual, by the indiscriminate use of alcohol. It is true that some diseases—*e.g.*, diphtheria—would seem to make a sick person more tolerant of alcohol. Nevertheless, he prefers to give ammonia when a pure stimulant is required. He looks upon repeated narcotic doses of alcohol as dangerous in critical illnesses, as tending to paralyze the higher centers, and to unhinge the nervous mechanism generally.

Sir William Gairdner has, for the last thirty or forty years, championed the cause of great moderation in the use of stimulants in acute disease. His teaching and his experience

may be said to have given the death-blow to that of Todd, which consisted in pouring in alcoholic stimulants in proportion to the weakness of the patient. Indeed, Gairdner's teaching practically amounts to this, namely, that alcohol should be used in acute disease on the same lines as in comparative health, "to quicken and develop the appetite for real food and the power of assimilating it," and that stimulants should not be given except with food, unless for the purpose (as a drug) of procuring sleep. Gairdner regards alcohol—even if hypothetically a food—a bad food in acute disease. And his successful record of the treatment of cases of typhus fever was achieved without employing alcohol at all, in the vast majority of his cases. Dr. Maclachlan agrees entirely with Sir William Gairdner's teaching, except that he regards alcohol as a food in acute disease, as well as a dietetic stimulant; only it is a food that must be given in small quantities and in a diluted state, to avoid its exhausting stimulating effects, and imperfect assimilation.

A very sick patient is practically a starving one, and very large doses of alcohol cannot be a fictitious danger. During the night the patient should be fed twice or thrice at least. Little and often is Dr. Maclachlan's motto, both in regard to food and drink, in severe illnesses.

Medicinal.—In the diseases under consideration, there are three drugs he pins his faith to, namely, opium, digitalis, and quinine, given in his opinion in the order of therapeutic merit. He prefers to give them in pill form. The dose of the several ingredients may be altered to suit the exigencies of the case. He generally gives one grain of opium, one grain of quinine, and one-fourth grain of digitalis, every two, three, or four hours, according to circumstances. The combination of these three drugs in pill form generally goes by the name of Niemeyer's pill. It is most valuable in supporting the circulation at the dangerous period of an illness, preventing death from heart failure —the common cause of death in acute disease. Dr. Maclachlan attributes the successful issue of most of the cases narrated above as chiefly due to this pill.

IMPROMPTU POST-MORTEM CÆSARIAN SECTION.

Attention has recently been called by COLLE (*Echo Médical du Nord*, June 25, 1899) to the grave legal responsibility assumed by a physician who undertakes to save an unborn infant's life by performing Cæsarian section upon a recently dead mother without, as would usually be the case, the permission of the husband or relatives of the deceased. It seems that Colle was calling upon a patient whose confinement was expected shortly, when she suddenly fell dead in his presence. Hastily securing instruments from his house, he delivered within fifteen minutes a living child by abdominal section. Naturally rumors began to circulate that the mother was not dead, and the possible legal risk the doctor had assumed so impressed itself upon him that he later advocated the delivery of the child in similar cases by accouchement forcé.

So far as we know, there has been no malpractice suit brought in any similar case, which is rather strange; but the suggestion of Colle is well taken.

Some years ago the writer had a case of sudden death of the mother in which he delivered the child by accouchement forcé, when the thought of what might have been had he done a Cæsarian section was very deeply impressed upon him. The patient, an Irish primipara in the first stage of labor, died suddenly while attended by an assistant. On arrival, twenty minutes after death, the writer found the main room of the tenement house occupied by some sixty highly excited friends of the deceased, and the young doctor suffering from cold sweats faithfully standing by the patient in the adjoining room.

Finding the mother's heart silent, and quickly realizing the impossibility of securing the consent of any of the assembled convocation in time to render Cæsarian section feasible, and that it would be worth one's life to so operate without consent, we promptly shut the door, took a pocket penknife, and slit the cervix thoroughly and delivered a still-born child. The time required to effect delivery was not more than two to three minutes. There was no external wound, and so there was no suggestion of fault-finding to the crowd of emotional friends, many of whom would have been only too glad to vent their feelings against a doctor rather than blind fate. Delivery through the vagina instead of the abdominal wall can be accomplished with the forceps or by version in almost as short a time as by abdominal section, except where the pelvis might be contracted.

The chief consideration in this subject is not, however, the safest way to do the operation—safest for the physician—but whether it should ever be done until the death of the mother is a certainty.

Dohrn has made a special study of this question (*Volkmann's Samml.*, No. 188), and cites several cases in which maternal death was apparent and Cæsarian section performed. The first was that of a living child, extracted seven hours after supposed death (it being held that the mother must have been alive); a second referred to resuscitation of a woman after apparent death from hemorrhage; while a third, the most significant of all, was an apparent death from meningitis, where after three-quarters of an hour of vain effort to resuscitate the woman, the attendant was about to perform the Cæsarian operation when the patient came to life.

Statistics kept for many years in Würtemberg show that out of 100,000 confinements, the Cæsarian section had been performed, post-mortem, on thirty-six women.

Kendall (*Virginia Medical Semi-Monthly*, Jan. 27, 1898) reported two cases of post-mortem Cæsarian section following rupture of the uterus, with one child living.

Considering the comparatively small number of children saved out of the number delivered by post-mortem Cæsarian section, and the frightful character of the situation for both mother and physician, where the operation might be mistakenly performed upon a living woman, it is certainly best for the physician to delay operation while any doubt remains of the mother's demise. Further, it would seem best to select the vaginal route for delivery whenever possible.—*Obstetrics*, August, 1899.

THE TREATMENT OF ECLAMPSIA.

In *Obstetrics* for August, 1899, DE LEE gives the following directions for the treatment of this formidable condition:

1. Protect the patient from the vehemence of the convulsion. Absolute quiet in bed, surrounded with pillows; remove false teeth; have a gag near at hand to put between the teeth to avoid injury to the tongue. A clothes-pin covered with a soft cloth and placed between the jaws so as to develop the elasticity of its arms answers very well. The room should be darkened, all noises rigorously excluded, no jarring of the bed, slamming of doors, talking, moving about, etc., and the patient should be disturbed not more than is absolutely essential. These are not minor points, but are important, as convulsions are caused by the slightest external impression or irritation.

2. Narcotize the woman. The arguments as to utility and safety of this procedure are not yet closed, but they seem to be tending toward the recognition of its value in the majority of cases. Give one-quarter of a grain of morphine hypodermically every thirty minutes until three-fourths of a grain is taken. Give forty-five grains of chloral per rectum, and repeat in two hours, if necessary. Chloroform is now recommended only when one convulsion follows the other in rapid succession. Under the above treatment this will not occur, so the writer desires the use of chloroform restricted to anesthesia for operative purposes.

3. Shall bleeding be practiced? The pendulum is swinging back. In cases where the convulsions occur in spite of the above medication, where the pulse is strong and full, face flushed or even cyanotic, where, in short, the case may be called sthenic or apoplectic, bleeding will do good. It is not necessary in all cases, but when it is, it should be practiced until there is a perceptible effect on the pulse. In cases where the pulse is weak and running, or absent, where cyanosis and pallor are combined, where the case is of the asthenic variety, the utility of bleeding is doubtful. Stimulation is indicated—strychnine, nitroglycerin, camphorated oil. Where the right heart is engorged, and pulmonary edema threatens, bleeding, together with powerful cardiac stimulation, may tide the patient over. The pulse here is not the guide. In general it may be said regarding venesection in eclampsia that it has a place in the treatment, and an important place, but that careful discrimination should be used as to the cases in which it is practiced, the amount of blood withdrawn, the period at which it is drawn, and in making deductions regarding effect.

4. Aid elimination. The means given previously may be employed, adapting them to the conditions present. If the labor is in active progress, little can be done with hot packs, nor is it desirable to have the field of operation flooded with fluid feces, the result of croton oil. Diuretics are too slow during active eclampsia. An excellent remedy, applicable to all stages of labor, is the subcutaneous injection of normal saline solution. The effect on the kidneys is remarkable. It has been used in combination with venesec-

tion to supply the place of the blood withdrawn, and is sometimes called "washing the blood," theoretically a good procedure. When labor is not in progress, and during the puerperium, all the efficient eliminatory measures may and should be employed.

Treatment During Pregnancy.—In a given case of eclampsia, when labor has not yet begun, try to tide the patient over the present danger by the means just given, and induce labor after the tendency to convulsions is past, or wait till labor comes on naturally. In the modern trend toward operative measures, those successful cases, not a few, where expectancy and medication lead to a favorable termination are being ignored.

Theoretically, if one should induce labor when eclampsia is threatening, one should end the pregnancy when it has broken out. Clinically, however, one can often overcome the convulsions, the fetus may die and be expelled, and, what is not so rare that it may be neglected, the patient may go on to term, and have a living child. If the convulsions are at all severe, labor usually comes on without much delay.

The dangers of injury and shock in the rapid dilatation and emptying of the uterus, and the many irritations to the already overwrought nervous system made by it, may more than outweigh the advantages of the immediate termination of pregnancy. Should medicinal treatment have no effect, the convulsions getting more frequent, longer, harder, or the pulse getting more frequent with a rising temperature, induce labor. Puncture the bag of waters first. In a third of the cases the convulsions cease, in another third they become less strong, but in the rest they do not improve. Labor usually comes on at once, especially if the fits are violent. They stimulate the uterus, and labor pains are often strong. If necessary to hasten the labor, dilate the cervix with Barnes's bag or the colpeurynter.

Treatment During Labor.—All authors are agreed that during labor one should terminate the process as soon as possible. The greatest differences exist, however, in regard to the amount of force to be employed. Accouchement forcé should almost never be used. By this is meant the rapid dilatation of the cervix, incising it if necessary, and the immediate extraction of the child.

Dr. De Lee says he cannot agree with those who say that it is possible safely to stretch, tear, and cut the cervix open and extract the fetus in thirty minutes to an hour. Unless the upper part of the cervix is effaced—that is, drawn up into the body of the uterus (carrying the circular artery with it)—the dangers of rapid dilatation by any of the means employed are great. Laceration of the cervix, even to the peritoneal cavity, hemorrhage even fatal, later sepsis, have occurred often enough to warn against this procedure. When the cervix is effaced, and the os begins to dilate, the case has an entirely different aspect; then the dilatation by the hand or incision is comparatively without danger. It must never be forgotten that stretching cannot replace the natural process of effacement and dilatation, and that it is therefore in the highest degree desirable, in cases where operative delivery is to be made, to wait until the cervix is thinned out—that is, shortened—and the dilatation at least beginning before it is attempted. The circular artery is then out of reach, and the incisions, as given by Dührssen, or the lacerations, are not so dangerous.

The only means to produce this effacement of the cervix is the uterine action. Stretching from below or pulling rubber bags through will not do it, except insomuch as they produce uterine contractions. In cases, therefore, where rapid delivery is indicated, the writer uses Barnes's bags and the colpeurynter to dilate the cervix, as they at the same time evoke pains and hasten the shortening of the cervix. Manual dilatation of the cervix is accomplished by a method similar to that described by Edgar, of New York, which the writer has used for five years with success, varied by a few failures. The cervix will sometimes tear under the manipulations so that recourse must be had to incisions, or it will not give way to any justifiable force, when the scissors may again be necessary.

The delivery is best accomplished by the forceps. Version is undesirable in eclampsia. If the child is dead, by all means perform craniotomy.

If there are perineal or vaginal tears, repair them; if cervical, leave them alone, unless hemorrhage gives the indication. The delivery of the placenta is as usual. If contraction and retraction of the uterus are good, postpartum hemorrhage is not to be feared. Do not tampon the uterus if at all avoidable.

The child is not seldom asphyxiated; it may be narcotized by the drugs given the mother, and it may have convulsions similar to those of the mother.

It is well to remember that in eclampsia

labor is usually rapid, and the patient being unconscious, the baby may be born unexpectedly under the bedclothes. It is well to leave the case to nature if the labor is progressing rapidly, if the convulsions are not too severe, if the color of the patient is not cyanotic, if the pulse is good, the fever not above 102°, and there be no signs of edema pulmonum.

As soon, however, as the cervix is completely dilated there is usually no need to wait longer, and the delivery may be completed under chloroform. Only in the gravest emergency should forcible means to empty the uterus be employed. Cæsarian section has no place in the treatment of eclampsia unless the woman is about to die and the child is alive.

From the above it may be seen that Dr. De Lee leans toward an expectant plan of treatment of eclampsia; but it will be seen also that under proper indications on the part of the mother, active, decisive, operative measures are advised.

Treatment During the Puerperium.—Those measures given above—that is, those appropriate to all cases—come into play here to the fullest extent. The eliminators must be stimulated to the full safe limit. Narcotics must be used more sparingly now, unless the convulsions are very violent, as it seems that they increase and prolong the coma, and lock up the secretions. During the labor where the irritation from the genitals is being kept up, narcotics are necessary, and we must take their bad effects with the good. No drug is an unalloyed good.

Saline solution may be given in large doses hypodermically, and oxygen, which is supposed to aid elimination by the lungs. Dr. De Lee has used oxygen in only one case—puerperal eclampsia—but there was no effect, not even on the cyanosis.

Veratrum viride has been much extolled as a specific for eclampsia, and it did for a time take that part of the place of bleeding that chloroform did not usurp. Now bleeding is taking its place again to the disuse of chloroform, and veratrum is being less used than it was. It is said that by this drug the pulse may be kept at 60, and then no convulsions can occur. Dr. De Lee says he has had but little recourse to this drug, but in one case the fits recurred even while it was being pushed to its physiological effect. It may be used with other remedies.

In general the treatment of this grave accident is much the same as the treatment of any other disease—not one drug or course of procedure for all cases, but a proper individualization of the cases and a careful application of the method suited to each.

QUININE IN MALARIAL HEMOGLOBINURIA.

The *Memphis Lancet* for September, 1899, a journal published in a part of the country in which malarial hematuria is common, replies editorially to an advocate of the use of quinine as follows:

"The *Journal of the American Medical Association* bemoans the fact that it still reads the 'assertion' that the administration of quinine in malarial hemoglobinuria aggravates the 'symptom,' and then asserts that very few practitioners in the malarial districts believe that quinine will produce this condition.

"The *Journal*, by rules of logic which are naive, to say the least, says: 'Why the hemoglobinuria of malarial origin has been singled out among all the other varieties and stated to be increased by the use of quinine is not clear. Thus we have (1) paroxysmal hemoglobinuria, and (2) toxic hemoglobinuria, including that due to chlorate of potash, carbolic acid, naphthol, carbon dioxide, and the poisons of infectious fevers, etc.' It says further: 'The bright-red urine observed is not always a hematuria—in fact, a hematuria is the rare exception, for hemorrhages, of whatever nature, are uncommon in all varieties of malaria.'

"It is very easy to sit on the editorial tripod on the shore of Lake Michigan and, in the above *ipse dixit* style, dictate to experienced men how they should treat a 'symptom,' of which the editor shows his ignorance by calling it such. Malarial hematuria (one term is as good as another, since both are incorrect) is a pathologic entity, with a symptom-complex all its own. To place it in a category with other conditions which also have one of the symptoms does not strike the ignorant swamp doctor as good logic. Now, to begin with, the form of malarial fever accompanied by bright-red urine we denominate hemorrhagic malarial fever. There is a distinct hemorrhage, and it is most effectually treated with quinine, and rationally so, because the malaria is in an active form and requires the classic remedy for its removal. Not so in the other condition; here the bulk of the color is due to methemoglobin, the urine is black or the color of port wine, and, the *Journal* to the

contrary notwithstanding, there is always some blood present. In this condition the malarial organism is either already absent or is rapidly disappearing from the blood.

"The symptoms of icteric methemoglobinuria of malarial origin are about as follows: After a variable history of previous intermittents, treated with quinine, the patient is suddenly taken with a chill, lasting from a few minutes to an hour, the thermometer indicating from 101° to 106°, usually about 103°. This is followed by no increase of temperature and absolutely no sweating. After a short time, from a few minutes to an hour, the patient will pass with great vesical tenesmus from 30 to 300 cubic centimeters of dark-colored urine; if the quantity is small it is inky black, and the prognosis is bad. The urine is highly albuminous, and contains a variable number of blood disks, mostly bleached out; the specific gravity is from 1025 to 1040. If the patient is still under the influence of quinine, a second or third rigor may appear, without any periodicity, and each additional dose, with mathematical precision, will bring on a paroxysm, and each paroxysm is followed by darker urine, but if no more rigors appear it will gradually clear up. The patient has an anxious face, rapid, sighing respiration, a rapid, feeble pulse, and more or less nausea. In from six to ten hours after the onset active vomiting appears, which is projectile, the skin becomes markedly jaundiced (darker than obstructive jaundice), the bowels are obstinately constipated, and the shock becomes more marked. The blood in the beginning may contain from three to four million red cells, some plasmodia, and there may be seen some phagocytosis. In twelve hours the count may be one and a half million, and the plasmodia may have disappeared; even at the autopsy they may be absent in the internal organs.

"In favorable cases, after sharp elimination, all the symptoms gradually disappear; the stools, which were at first black and tarry, become lighter and of a golden-yellow color; the urine is voided frequently, becomes more dilute, and contains epithelia and all kinds of casts. In fatal cases the rigors continue, the patient becomes delirious, suppression sets in, and he dies with 'uremia.' Or there may be amelioration of symptoms, but with suppression, the patient will feel well and will not believe that he is certainly doomed, and may live eight days after complete suppression. In some few rare cases the plasmodia may persist and give rise to a febrile movement; in such we use methylene blue, some preferring sodium thiosulphate.

"Now, the writer will tell the learned editor of the *Journal* a secret: he has never seen a case treated with quinine recover; on the other hand, by the eliminative treatment the majority of cases make a rapid recovery. This is no editorial bombast, but can be attested by thousands of swamp inhabitants. If a malarial infection is promptly and scientifically treated with quinine this peculiar disorder can be positively prevented, but the dilatory and improper use of it in the face of a malarial cachexia will certainly bring on an attack of methemoglobinuria in a susceptible individual.

"The writer has seen several cases of quinine methemoglobinuria; it has no existence apart from malarial cachexia. The editor of the *Journal* can find any number of such cases in the Mississippi valley, providing he has money enough to induce a subject to take a dose of quinine; they generally take arsenic. It seems to be a chronic condition. We admit that we do not understand it, but know, however, that in chronic malaria the hemoglobin percentage falls after quinine is exhibited, just like the pulmonary effect of a mercurial inunction in secondary syphilis."

ACOIN, A NEW LOCAL ANESTHETIC.

R. L. RANDOLPH, of Baltimore, writes as follows of this new drug in the *Ophthalmic Record* for August, 1899. He begins by reminding us that in the January number of the *Therapeutische Monatshefte* there is an account of the discovery of a new local anesthetic — acoin — by Trolldenier, of Dresden. Trolldenier's first experiments to show the toxic properties of this product were made on dogs. His results demonstrated that acoin was much less poisonous than cocaine.

The anesthetic properties were tested on the rabbit's eye. At first the powder was tried, and then concentrated solutions; but in these forms it proved too irritating, though it produced anesthesia which lasted "several days." With weak solutions these results were obtained: 1:10,000 produced anesthesia lasting for fifteen minutes; 1:4000 produced anesthesia lasting for thirty minutes; 1:2000 produced anesthesia lasting for sixty minutes; 1:1000 produced anesthesia lasting for 40–80 minutes; 1:40 produced anesthesia lasting for over a day.

Solutions of 1:40 were irritating, though

they produced no injury. It was found that the solutions were but slightly influenced by light, and when exposed to the air from three to eleven days were shown to be sterile.

Dr. Randolph says so far as he knows acoin has not yet been tested upon the human eye. His first experiments were made with a solution of 1:3000. With this solution he has extracted fifteen foreign bodies from the cornea. It was noticeable, however, that in those cases where the foreign body had been embedded for some time and where there was congestion, repeated instillations were necessary to make the removal possible, and even then the anesthesia did not seem as complete as with either cocaine or holocaine.

Where there was no congestion the removal of the foreign body was painless. One pterygium was removed, and the author noticed no difference in the anesthesia from that produced by either cocaine or holocaine. Two tarsal tumors were opened and curetted, and the operations were about as painful as when performed under cocaine or under holocaine. He has had no opportunity of making the corneal incision, but says he should think that acoin would produce satisfactory anesthesia for such an operation so long as the eye was not in a condition of irritation. The stinging following the instillation of a drop of acoin is greater than that after cocaine. This was shown conclusively. A drop of acoin was dropped into one eye and a drop of cocaine into the other, and in every case the acoin was more painful. In this respect it resembles holocaine. It took quite as long to produce satisfactory anesthesia as it does with cocaine, and longer than it does with holocaine. In this respect his results do not agree with those of Trolldenier and Hesse, who call attention to the rapidity of its action. It will be remembered, however, that the experiments of these observers were made on rabbits, and from the well known behavior of these animals on the operating table we would not be inclined to think that their sensitive nerves were very highly developed.

Acoin is a white powder, quite soluble in water in the proportion used in the author's experiments—*i.e.*, 4½ grains to the ounce of water. It is derived from guanin, which is found in almost all animal and vegetable cellular tissue. Acoin is related to caffeine and theobromine.

Randolph concludes that:

1. Acoin in solutions of 1:100 and 1:300 produces satisfactory anesthesia in an unirritated eye in about the same length of time as cocaine.

2. In more than one case where the eye was congested repeated instillations of acoin were inadequate to produce satisfactory anesthesia.

3. Inspection of the cornea with a high-power lens failed to show any defects in the epithelium after its use.

4. Acoin has no effect upon accommodation.

5. It has no effect upon the size of the pupil.

6. It does not increase intra-ocular tension.

7. Several experiments showed that the staphylococcus pyogenes albus did not grow in agar which contained acoin in the proportion used in the clinic, and furthermore, that exposure of this organism to the action of acoin for twenty-four hours was followed by the death of the organism. This would look as though acoin were not only an inhibitor of the growth of the staphylococcus albus, but that it also killed this organism after a certain length of time.

It is of course evident that conclusions drawn from this limited experience with acoin may have to undergo more or less modification with further trial.

ON THE CONSERVATIVE TREATMENT OF TUBERCULAR JOINTS AND COLD ABSCESSES, AS PRACTICED BY MIKULICZ OF BRESLAU—1890 TO 1896.

CATHCART (*Scottish Medical and Surgical Journal*, March, 1899) states that for some years past, in addition to fixation and rest, two very simple means of treating such cases have been in use—*i.e.*, the injection of iodoform, and the artificial production of venous congestion known as Bier's treatment. Allusions have been made to each of these in the medical papers from time to time, but as so many other methods have also been advocated we are often at a loss to know which of them may be expected to take a permanent place among therapeutic measures. In coming to a decision in such questions we naturally value the opinion of men of high standing and wide experience, who have had ample opportunity of watching such results. Professor Mikulicz is one of these. He has advocated the use of iodoform since 1882, and is so well known as a surgeon that we may be sure that his preference for non-

operative measures is certainly not due to any want of ability and readiness to operate, if operation would serve the purpose as well.

Mikulicz uses only a ten-per-cent emulsion of iodoform in glycerin. One great advantage of glycerin over other agents is that it is a strong antiseptic. It will destroy all the known pus-forming organisms, and as iodoform outside of the body is practically an inert powder, this saves much trouble and anxiety.

With regard to the dangers of the iodoform-glycerin treatment, we are told that all authors are agreed that a careful attention to the proper dosage makes it quite possible to avoid the danger of poisoning. The symptoms that have been described of an excessive dose of iodoform are severe mental perturbation, raised temperature, rapid pulse, paleness of the face, fixed eyes, spasmodic movement, albumin and strong iodoform reaction in the urine, and the latter also in the saliva. The test consists in adding a little starch paste with sulphuric and nitric acid to the suspected fluid; the iodine is set free and turns the starch blue.

But glycerin itself has been shown capable of producing toxic symptoms. In slight cases there is a rise of temperature within twenty-four hours of the injection to about 38.5° C., with a pulse of about 115; these symptoms generally subside again in twenty-four hours. For a few hours blood pigment is found in the urine, but no kidney elements, nor blood-corpuscles. Corresponding to the blood pigment there are traces of albumin. In more severe cases the temperature often reaches 39° C.; urine is of a deep brown color, and has a considerable sediment containing hyaline and granular tube casts, and a reddish-brown detritus of amorphous lime salts, but no blood-corpuscles. In a fatal case the collapse prevented the temperature from rising, but the pulse went up to 160; there was also sickness, vomiting, great thirst, restlessness, stupor ending in coma. Urine decreased in quantity, and of a dark brown color. Death on the third day. At the post-mortem examination a high degree of acute parenchymatous nephritis was the chief pathological change found. This was a case of hip joint disease with abscesses in a child aged four years. The disease had been treated by Billroth's method, and from 60 to 65 cubic centimeters of iodoform-glycerin had been used.

Outside the body iodoform is practically inert, but when injected into a chronic abscess or other tubercular area it attacks the bacilli apparently after having been decomposed. Its action on the tissues is to increase the development of connective tissue. The clinical value of iodoform in tuberculosis is undoubted, and that for our present purpose is sufficient.

Glycerin is destructive to bacteria, and although dangerous to the patient if injected in too large a quantity, it may be safely used if the proper dosage is respected.

For puncture and injection of abscesses a medium-sized trocar is needed, which fits tightly into the point of a syringe. In case the trocar should become blocked with curdy matter, a sound should be at hand to clear the bore.

For parenchymatous injection and for small abscesses a metal-mounted glass syringe is recommended, holding about fifteen cubic centimeters. It should have rings on the piston and barrel to enable pressure to be made with greater ease. The sharp-pointed cannulæ should be of different lengths, and should vary from 0.9 to 1.5 millimeters in diameter. They should screw on to the syringe to prevent their starting out when pressure is being exerted. Before use the cannulæ should be boiled and the syringe soaked in carbolic solution for several hours.

The quantity of the fluid injected depends on circumstances. For parenchymatous injection into the substance of pulpy synovial membrane, from four cubic centimeters in young children to thirty cubic centimeters in adults may be used, but it is better to begin with small doses and watch the results. For cold abscesses larger quantities may be employed, because the absorption from the abscess walls, which are protected by granulations, is much less than from fresh surfaces. As much as 100 cubic centimeters may be used for adults, and proportionately less for children. If the granulation wall of the abscess has been removed by operation, a much less quantity must be used. On the withdrawal of the trocar a pad of gauze is fixed in position with crossing pieces of sticking-plaster, and over all compression is produced by overlapping turns of sticking-plaster. If the pus should be so thick that an incision is necessary, the wound is sewn up at once.

In the case of abscess an oblique puncture is considered advisable, and if the skin over the abscess should be thin and in danger of giving way, the puncture should be carried

through the sound skin at a little distance from the place where pointing has begun. When this is done the thin skin often recovers.

In parenchymatous injection, or when injecting undistended joints, it is more difficult to disseminate the iodoform than where simple abscesses are being dealt with. Tubercular joint cavities, too, are apt to be subdivided into separate compartments, and these have to be dealt with individually. The action of iodoform is confined to the part to which it is applied. Only a slight amount of dissemination occurs through the lymph stream, and that merely within a small radius from the place where it is injected.

Owing to the fact that the dissemination of iodoform is limited, the method of carrying out parenchymatous injection has to be adapted to meet this difficulty. The various parts of the joint have to be attacked in succession. The needle is plunged deeply in, and firm pressure is exerted upon the piston of the syringe till the point of the needle feels loose; it is then withdrawn a little, and the same is done again. Before taking out the needle it is thrust in a new direction, and the same procedure is adopted till the required quantity has been used. Next time another part of the joint is selected, and so on till the whole of the affected tissues has been overtaken. Even softened bones can be dealt with in the same way, but much greater pressure is required.

To provide for the swelling and tenderness that may be expected, when the lower limbs are affected weights are lightened, bandages loosened, and limbs previously free are steadied with sand-bags; until the reaction is over patients who were going about are kept in bed. Except where the pelvis or lower limbs are affected, however, confinement to bed is not thought necessary. Sequestra in bone are not to be taken as necessarily contraindicating a trial of iodoform injection. If the neighboring parts of bone can be infiltrated with the emulsion, the bacilli will be killed, and the sequestrum may be gradually absorbed.

The injections are made at intervals of from eight to fourteen days as a general rule; sometimes much longer, but never under five days. The length of the interval is regulated by the amount of reaction, which should always have completely subsided before the next injection is undertaken. Where simple spaces are being injected in joint cavities or abscesses, the interval is longer, because the drug is generally brought into contact with the whole surface at the first injection.

The fluid distention in an abscess or joint is increased by the injection for the first two or three days. After that it gradually subsides, and in favorable cases disappears in from four to six weeks. The abscess becomes a scar, and instead of the hydrops there is a thickening round the joint with more or less disturbance of its function. The final disappearance of the fluid may be hastened sometimes by the pressure of an elastic bandage. A second puncture may be made at the end of from four to six weeks, but if the fluid found in the cavity then contains iodoform, a further addition of the drug is not necessary. Many abscesses are cured by a single injection; seldom does it need to be repeated more than once. Where an abscess complicates pulpy degeneration the two forms of treatment are combined—*i.e.*, the abscess is injected at long intervals and the synovial thickening receives parenchymatous injection at shorter intervals.

Billroth's method previously alluded to has been employed in certain cases by Mikulicz. Tubercular foci and granulation tissue are scraped away, and bleeding stopped by plugging with iodoform gauze or ligature of vessels when necessary. The wound is then closed by sutures, with the exception of a narrow aperture left for the removal of the gauze and for the subsequent injection of the iodoform and glycerin; it being always remembered that the absorption is much greater from fresh surfaces than it would otherwise be.

Cases coming for treatment with fistulæ already in existence are not so easy nor so satisfactory to deal with. Sometimes sinuses may be scraped out and dealt with by Billroth's method. Where the whole sinus cannot be reached, however, this plan should not be employed, and we must trust to injection of the emulsion under pressure. A conical nozzle is pushed into the fistulous opening, and if too small to block it, is supported by a plug of gauze; the fluid is then forced firmly along the sinus and is retained, under pressure by the finger or a plug of gauze, for about ten minutes after the nozzle is withdrawn. After that a plug of gauze is fixed over the opening with sticking-plaster, and compression is maintained with an elastic bandage for several hours. Such injections may be repeated twice or thrice a week, depending upon the amount of reaction.

So far as the pulpy membrane and the tubercular bone are concerned, the only rule is to inject into the part which seems to be diseased; but the cavities of the different joints are best reached from the points which Krause showed after careful investigation to be most suitable.

For the wrist-joint points should be chosen just below the styloid processes of the radius and ulna.

For the elbow, the needle should enter just over the head of the radius in front. At the back the cavity of the joint may be reached from the radial side, the thickened capsule on either side of the olecranon.

For the shoulder Krause thought it better to work laterally from the coracoid process or from the spine of the scapula where it joins the acromion.

The ankle-joint is accessible from the apices of the malleoli. The needle is passed at first directly inwards, and its point is afterwards turned up. The thickened capsule may be felt on either side of the tendo Achillis behind, also in front, and is everywhere accessible.

The tarsal bones and joints can be most easily reached from the dorsum and sides of the foot.

The knee can be easily entered by a puncture on either side of, or just above, the patella. The subcrural bursa should not be omitted in tubercular synovitis. The needle to reach it should be passed through the tendon of the quadriceps.

For the hip-joint, either Krause's or Bünger's points may be used. The former directs the patient to be laid on his back and the thigh extended, adducted, and slightly rotated inwards; a long needle is then entered above the great trochanter at right angles to the axis of the thigh, and is pushed in until it strikes the head of the femur or the neck just below the head; when guided upwards over the head it enters the joint. Bünger directs the injection to be made as follows: From the place where the femoral artery crosses the ramus of the pubes a line is drawn to the tip of the trochanter, and the needle is entered at the point where this line crosses the inner border of the sartorious muscle; it is then carried directly back into the joint. Both methods have been used at Breslau to reach the cavity of the joint, and also to attack the swollen synovial membrane. The back of the joint is accessible from the posterior border of the great trochanter.

Psoas abscesses are punctured as soon as they come sufficiently near the surface to allow of their being reached without fear of passing through the peritoneum. Otherwise there would be a risk of causing tubercular peritonitis.

Since 1892, when Bier brought this method before the German Surgical Congress, it has been extensively used in Kiel and elsewhere, and it has been employed at Breslau since the beginning of 1893 in combination with the application of iodoform as already described. The object is to produce venous congestion. It is not clear how the beneficial change is brought about, but that such does take place there seems to be no room for doubt. The limb is first bandaged firmly to within a few inches of the joint. Above the affected joint a rubber tube or bandage is then wound sufficiently tightly to produce a distinct bluish-red discoloration of the skin of the unsupported parts below.

In some patients the full amount of congestion can be easily borne from the first, in others it must be begun gradually and increased as the patient gets used to it. The congestion may be maintained for from fourteen to eighteen hours out of the twenty-four, and the remaining time may be employed to get rid of the edema by the use of elastic pressure applied over the joint itself. As the condition improves, the length of time during which the congestion is kept up may be diminished by degrees. To prevent ill effects from the pressure of the elastic bandage, its position should be frequently altered and an ordinary bandage should be applied between the skin and the rubber.

In the parts of the limbs where the venous congestion is applicable—*i.e.*, below the hip or shoulder—this method and fixation (or attempted improvement of the position of the joint) constitute the first stage of the treatment; and this is continued for from eight to fourteen days. Then from six to ten cubic centimeters of the emulsion for children and from fifteen to thirty cubic centimeters for adults is injected into and round about the joint. Abscesses, however, are injected straight away if the diagnosis is clear and their position suitable.

The intervals at which the injections are to be repeated have already been mentioned. During the longer intervals the patient may be sent home or to some health resort, but all the time the venous congestion should be maintained. When a fair trial of conservative treatment has been given without definite

improvement, operative measures will require to be undertaken; but the experience in Professor Mikulicz's clinic has been that the operations, since these conservative methods have been in use, have not only been much fewer, but also much less serious. This conservative treatment has established itself more and more firmly in favor as time has gone on. The actual number of cures by its use is equal to that attained by the ordinary operative methods, while the functional results which it gives are decidedly better and the mortality is less. Only in adults, with a fixed patella, is primary excision preferred to the conservative measures which have just been indicated.

POSTERIOR MEDIASTINITIS CURED BY OPERATION.

HEIDENHEIM (*Centralblatt f. Chirurgie*, No. 27, 1899) reports the case of a workman operated on because of an abscess of the posterior mediastinum at about the height of the aortic arch. This patient had swallowed a bone a year and a half before, and for two weeks after this complained of pain in swallowing. When he was first seen by the reporter he had not been able to swallow anything for five days, and had suffered from a swelling above the right clavicle for fourteen days. Moreover, there were symptoms of septic absorption, irritability of the heart, and violent pains in the chest. The supraclavicular fossa was almost completely obliterated by an edematous swelling.

A transverse incision was made just above and parallel to the clavicle, and the clavicular insertion of the sternomastoid muscle was divided. The tissues were markedly edematous. An opening was then made by blunt dissection outward and backward toward the spinal column and esophagus. A mass of foul, necrotic connective tissue was found surrounding, at a depth of about three inches outward and backward from the sternoclavicular articulation, a collection of pus. The wound was packed, and healed without complication.

The examination of frozen sections shows that just above the jugulum, and at the level of the first dorsal vertebra, there is a considerable area of loose connective tissue to either side of the esophagus, somewhat broader on the left than on the right side. It has lying behind it the bodies of the vertebræ. The approach to this loose connective tissue is an easy one. After division of the clavicular end of the sternomastoid muscle, by working backward from a point just above the sternoclavicular articulation, this space is reached on the right side through the comparatively wide interval lying behind the jugular vein and carotid artery. It is by this route that pus formed in the posterior mediastinum may reach the supraclavicular fossa.

Carazcani opened such an abscess which formed at the level of the sixth and seventh dorsal vertebræ. He preferred, however, to reach the pus by dorsal incision. The dorsal route is a comparatively simple one, provided the transverse processes of one or more vertebræ are divided at their bases together with the central portion of the ribs attached to the vertebræ. Thus all danger of wounding the pleura is avoided, and hence this method is better than simple resection of a portion of the rib with subsequent thrusting of the pleura to one side.

RUBBER GLOVES OR GAUNTLETS.

SUMMERS (*Journal of the American Medical Association*, July 8, 1899) urges the habitual use of sterilized rubber gloves or gauntlets after cleansing the hands by some good method.

It should be the rule: (1) In obstetric practice; (2) in operating on all forms of septic cases; (3) in the examination and treatment of all forms of septic infectious diseases, such as erysipelas, septicemia, and pyemia, in which the hands come in contact with primary or secondary foci of infection —and this rule applies to the nurse also; (4) in operating on clean cases soon after operations on infected ones; (5) in abdominal sections following vaginal operations on the same individual, this may be reversed, wearing the gloves during the vaginal work, and taking the gloves off or donning a fresh pair before beginning the abdominal work; (6) in examining fresh wounds after recent examinations of or operations on dirty cases; (7) in all forms of rectal surgery.

It is a matter of choice under other circumstances whether or not gloves be worn. However, there is no question that there is less danger of infection where gloves are worn than when reliance is placed in an attempted sterilization of the naked hands. We have the testimony of two good American surgeons, Halsted of Johns Hopkins and McBurney of New York, as to the truth of the lessened dangers of infection when sterilized rubber gloves are worn by all persons

taking part in the conduct of a surgical operation. Many American and European surgeons now use rubber gloves.

An impervious cotton glove is perhaps quite as good as the rubber article—the ordinary glove is not safe. The author states that during the six months he has been using rubber gauntlets in his work, the results have been more gratifying than formerly. Occasionally he has felt compelled to take off the gloves in order to carry out some technique more satisfactorily, but such acts seldom occur now. There is little difference in tactile sensibility between the naked fingers and those covered with a well-fitted, good-article rubber glove. The advantages outweigh the possible, in rare instances, lessened tactile acuteness. One dozen pairs of the best quality can be bought for fifteen dollars. Sterilized glycerin may be used to lubricate the hands before drawing on the gloves. A glove that cannot be reasonably easily drawn over the hand after filling it with sterile water is too small. Vaselin or grease ruins the rubber. The gloves should be either boiled or wrapped in a towel and placed in a steam sterilizer. Lastly, rubber gloves are a protection to the physician and surgeon against infection.

A PLASTIC OPERATION DESIGNED TO SUBSTITUTE, FOR THE SPHINCTER ANI, THE LEVATOR AND THE GLUTEAL MUSCLES.

LENNANDER (*Centralblatt f. Chirurgie*, No. 25, 1899) had brought to him a patient suffering from incontinence of the feces, as a sequel of a severe phlegmonous process which had entirely destroyed the anal sphincter. For the purpose of remedying this disability, the following operation was performed: A cut was made in the middle line, traversing the under half of the sacrum and the coccyx. From the point of this bone it was carried in a curve to either side, the convexity of which touched the tubera ischii. The two gluteal muscles were freed from the sacrum, and from the sacroischiac ligament. To a point corresponding to the upper half of this ligament these muscular flaps were still further freed by an inch and a half incision running from the sacrum in the direction of the muscular fibers. The scar tissue, which was placed about the posterior portion of the rectum, was, together with the raphe of the anal perineum, dissected from the point of the coccyx. The levator ani and coccygeal muscle were then exposed and were divided by a transverse cut reaching almost completely across the pelvis, yet so planned that the arcus tendineus of the levators was not too nearly approached, thus avoiding injury to the nerves which supply these muscles. The levator ani could not be separated from the coccygeus without dividing the inner layer of the pelvic fascia. The levators were drawn forward against the rectum, secured in this position by four catgut sutures placed in the middle line. The defect in the pelvic diaphragm resulting from this transposition was then closed by drawing the two gluteal muscles, which had previously been dissected loose, forward as far as the anus, and fastening them in this position by heavy catgut sutures; uniting them first each to the other, then to the levator ani, and finally to the periosteum of the coccyx. Two drainage-tubes were inserted under the gluteal muscles. The anal aperture was kept closed by sutures during the operation.

The wound suppurated freely. In spite of this the ultimate result was an extremely good one. The muscles were regularly exercised by means of the galvanic current and by voluntary efforts upon the part of the patient to retain enemata.

The author believes that this method of operating may be serviceable in relieving the incontinence which frequently follows cancer operations.

LAPAROTOMY FOR PERFORATED ENTERIC ULCER.

DALZIEL (*Scottish Medical and Surgical Journal*, July, 1899) states that about four per cent of enteric cases admitted to Belvidere Fever Hospital, Glasgow, die from perforation. During the last few years Dalziel has operated on eight cases of perforated enteric ulcer. Three were so advanced in general peritonitis that they were utterly hopeless; nor would he again operate in similar cases. Of the remaining five, one made a complete recovery; one promised well, but died the day after operation from intestinal hemorrhage; one lived three and a half days; while the other two continued to sink after operating, and though relieved from much suffering, died in about the usual interval after perforation.

The prognosis for operation depends upon the early diagnosis of perforation, on the stage of the fever, on the severity of the fever and condition of the patient, and on the nature of the peritoneal infection.

The first of these alone is under the control of those in charge of the case, and it would appear that it is a matter of some difficulty to arrive at an early and accurate diagnosis; nor is this to be wondered at, since the diagnosis depends on the phenomena of peritoneal irritation, so apt to be masked by the general toxemia attending the fever, or originated without any gross perforation at all. The usual classical symptoms, initiated by acute abdominal pain, often attended by a sudden cry, vomiting, the rise and perhaps, if in the acute stage of the fever, a sudden temporary fall in the temperature, the rapid increase in the pulse-rate, the rigid abdominal muscles, with flattening of the abdomen, soon followed by distention from tympanitis, and later from the accumulation of peritoneal effusion, the distressed thoracic breathing, the pinched features and anxious, terrorized look, no doubt form a clinical picture which cannot be mistaken; but when the picture is complete, and the diagnosis certain, it is generally too late for surgical interference to be of any avail.

After about twelve hours the peritoneal infection has become so extensive and profound that little hope can be entertained of so cleansing it that its phagocytic power, enormously great as it is, may overcome the microbic infection. Every hour that passes increases the gravity of the prognosis with the ratio of microbic multiplication. No doubt the "twelfth hour" will be reached at different times in individual cases according to the nature and amount of the initial infection, as for example whether it be the bacillus coli commune, a streptococcus, the mere chemical irritation of the intestinal contents, with absence or at least a very minimum amount of microbic growth. As a matter of fact, in some cases which have recovered no microorganisms were found in cultures made from the peritoneum twenty-four hours after the operation. The more aseptic the intestinal canal can be kept, the better the prognosis after surgical interference. The typhoid bacillus seems to play a small part in the peritoneal mischief, and has not been found in the free fluid from the peritoneal cavity.

It is necessary, then, to consider what symptoms may be relied on to warrant early diagnosis and operative interference.

The symptoms of abdominal pain and tenderness developing suddenly in or near the third week of the disease must be looked on as of serious import.

Tenderness on pressure is usually found to the right of and below the umbilicus, near McBurney's point in appendix perforation, and in the iliac fossa and flank in cæcal perforation. While in acute cases there may be considerable tenderness throughout the illness, it must be looked upon with grave suspicion if it occurs suddenly late in the affection, and should suggest the involvement of the serous covering of the bowel in the inflammatory process, or an actual perforation which may either form gradually, as in the case of a perforating ulcer of the stomach and as especially happens late in the disease after the fall of temperature, or suddenly from a gross slough of the base of the ulcer. Clearly tenderness may be due to a localized peritonitis over an ulcer, and this strengthened by deposit of lymph or formation of adhesions to surrounding parts may spontaneously recover or pass on to perforation. It is to be noted, as accentuated by Frank Gairdner in his monograph on "Peritonitis in Enteric Fever," that a local peritonitis initiated without perforation may extend, become general, and kill the patient.

This stage of localized peritonitis might well be termed the "preperforative stage," were it not that it is not necessarily followed by actual perforation. It ought, however, to induce extreme vigilance on the part of the physician, and probably his association in the case with a surgeon.

Actual perforation generally occasions pain so great as to make the patient cry out. The muscles overlaying the rupture become rigid. Sudden alterations of temperature are common. There is vomiting, probably only in one act, to be resumed in the later stages of the peritonitis as a continuous and distressing symptom. The pulse gets more rapid in every case, and very soon after perforation may increase in frequency with alarming rapidity.

In the preperforative stage the increase in pulse-rate may be comparatively slight, as from ten to fifteen beats per minute, and this with the other mild symptoms may, with the coating of protective lymph or formation of adhesions, lull the observers into a false security. The author states that in nearly all his cases the symptoms of the preperforative stage have been well marked. The symptoms are not peculiar to enteric ulcer perforations, but may be equally well marked in ordinary appendix ulcerations, and, as pointed out by Cushing, in dysenteric ulcerations as well.

Applying the principles which guide surgeons in cases of perforative peritonitis other than enteric, surely no one cares now to wait till the appendix has perforated in a case where there is good ground to fear it.

There remains, however, one symptom of which the author states he regrets he has had too little practical experience, but which seems worthy of careful elaboration, namely, leucocytosis, to which much attention has lately been paid, especially in the Johns Hopkins Hospital, by Thayer, and concerning which the following conclusions have been drawn by Dr. Harvey Cushing, in his excellent monograph on enteric perforations:

1. The appearance of leucocytosis in the course of typhoid fever points towards some inflammatory complications in the early stage.

2. If the complication be a peritonitis and remains localized, associated with a preperforative stage of ulceration or with a circumscribed slowly-forming peritonitis after perforation, it may be, and usually is, signalized by an increase of leucocytosis in the peripheral circulation.

If, however, a general septic peritonitis follows, the leucocytosis may be transitory and overlooked, as it disappears concomitantly with the great outpouring of leucocytosis into the general cavity.

Accurate early diagnosis is not a simple matter, and, bearing in mind the disaster in delay, it seems a wise course if in doubt to operate.

All of these cases are repeated at more or less length. There have now been over eighty cases recorded as recovering after enteric perforation; and while not a few proved to be localized by previous adhesions, the great proportion of them were perforations opening into the free peritoneal cavity. Later statistics indicate twenty-five per cent of recoveries after operation, and this, Dalziel believes, is a reasonable estimate.

The operation is usually a very simple one. The perforation can in ninety per cent be found without any difficulty, and with very slight exposure of the bowel. No blood is lost and no important structure is cut, and the patients bear what slight operative interference is required remarkably well. An incision two to three inches in length in the middle line below the umbilicus gives sufficient entry to the field of operation, and is indeed directly over the portion of the bowel most frequently affected. In three of Dalziel's eight cases the perforation was found in the first loop of the bowel presenting in the wound. In the others it was readily found by tracing the ileum upwards till the perforation was seen. The suturing of the gut is early accomplished by two rows of continuous fine silk sutures, carried beyond the margins of the ulcer.

INFLAMMATION OF THE HIP BURSÆ.

ZULZER (*Deutsche Zeitschrift für Chirurgie*, Badn. L.), on the basis of a case which led to repeatedly mistaken diagnosis, contributes a profitable study of the inflammations of the bursæ placed about the hip-joint. Inflammations of these bursæ are comparatively rare; and it is, perhaps, mainly because of this that when they are encountered a mistake is common. The two bursæ of chief clinical interest are the one placed beneath the iliopsoas muscle and the one lying beneath the gluteus maximus over the greater trochanter. Hydromata, cysts, and abscesses may occur in either of these bursæ.

A collection of sixty cases made by the author shows that fourteen were subiliac and the rest trochanteric.

The subiliac is placed below Poupart's ligament and beneath the iliopsoas muscle. When this bursa becomes inflamed and swells, the tumor may reach large dimensions, extending even as far as the middle third of the thigh. A smooth, tender, usually fluctuating tumor develops, often accompanied by pain along the course of the crural nerve, and sometimes complicated by symptoms of pressure upon the large vessels. There is some interference of motion, and occasional fixation. The leg is usually held in abduction, slight outward rotation, and moderate reflexion.

The disease is distinguished from coxitis by the absence of shortening, by the fact that the great trochanter is in its normal position, and by the absence of tenderness in the hip-joint. Injury is usually the cause of inflammation, though exceptionally rheumatism, syphilis, or gonorrhea may cause a bursa in this region. The disease is extremely chronic.

Trochanteric bursitis is characterized by much the same symptoms, except that it may be confused not only with coxitis, but with periarticular abscesses, or inflammation of the trochanter itself. The trochanteric bursa frequently becomes tuberculous.

The treatment should be radical, the entire sac being dissected out.

OPERATION FOR CLUBFOOT.

SCHANZ (*Centralblatt für Chirurgie*, No. 25, 1899) calls attention to the frequency with which the desired result is not attained after a very thorough series of operations for the remedy of the deformity and disability incident to clubfoot. Even though the patient treads upon the sole of the foot when the deformity is corrected, there is a permanent adduction of the anterior part of the foot and a shortening of the plantar fascia. To prevent this, he urges that the tendo Achillis should not be cut until the adduction and the contraction of the plantar fascia have been entirely overcome. The first operation divides all the structures which interfere with the proper position of the foot, excepting the tendo Achillis. A plaster-of-Paris bandage is put on, the patient is encouraged to walk, and four to six weeks later the tendo Achillis is cut.

OINTMENTS AND PASTES.

WENDE (*American Medical Quarterly*, June, 1899), holding that a careful selection of local remedies is of greater significance than a well directed constitutional administration of drugs, gives an admirable outline of the principles on which ointments should be compounded. Anhydrous lanolin he prefers as a basis.

Pastes, during the last few years, have been largely used in the treatment of skin affections, especially for the various types of eczema. They were first introduced to the notice of the profession by Lassar and Unna, of Germany. They are applications which resemble ointments, having a firmer consistence, however, due to a powder incorporated in an unusual proportion. The substances used may be either of a mineral or vegetable origin. The minerals generally employed are kaolin, talc, bolus alba, chalk, zinc oxide, calcium, and magnesium carbonate, while those taken from the vegetable world are usually starch and lycopodium.

The advantages over ointments are twofold. They not only defend the eruption from external irritation, exclude the air, preventing desiccation and oxidization, but the excretions and secretions of the diseased parts, through their influence, are also absorbed. Furthermore, they aid adhesion, producing a fixation of medicaments. These preparations employed for local application in the treatment of skin diseases are either of a hard or soft consistence, the former containing more or less gelatin.

One of the best known and useful belonging to this class is the so-called Unna's gelatin paste, made by the combination of:

℞ Zinci oxidi,
Gelatin, āā 7.50;
Glycerin, 15.00;
Aquæ destil., 20.00.

This forms a basis in which may be incorporated iodoform, salicylic acid, ichthyol, chrysarobin, thiol, or other antiseptics, to meet the indications of the case. It is beneficial in overcoming the evils engendered in subacute and chronic eczema and like inflammatory processes.

However, it is contraindicated in very hot climates, owing to its limitation, preventing solidification; nor is its application adapted to hairy parts, as its removal then would be painful. As a practical suggestion in its use before it has become hardened or set, it would be advantageous to gently pat it with absorbent cotton or cover it with a thin layer of cheese-cloth in order to prevent the undergarments from adhering to it.

Of the soft pastes, the one that has enjoyed the best reputation is that first prescribed by Oscar Lassar, and named after him. It consists of:

℞ Acidi salicylici, 2.00;
Zinci oxidi,
Amyli,
Vaselin,
Lanolini anhydr., āā 20.00.

Misce. Leniter lerenda fiat pasta.

This exceedingly useful therapeutical preparation is of extensive applicability, notably in the different forms of eczema. It is applied like an ointment, spread on the skin, leaving a coating on it and absorbing secretion instead of sealing it up.

Other remedies, as tar, beta- and hydronaphthol, ichthyol, etc., may be profitably combined. A gum paste is a modification of the soft variety, in that it contains gum arabic. This mixture should be carefully prepared without the aid of heat, and consists usually of some particular powder in the proportion of two parts to one of mucilage of acacia and one of glycerin.

Chrysarobin and pyrogallol should not be added to gum pastes. Fatty and soapy substances, if commingled in large amounts with these pastes, injure their special properties.

Their mode of application is a matter for attention and of importance. They should be gently rubbed upon the diseased part with the fingers or an appropriate spatula, the

former being used when the skin is tender. They should be well introduced into all cracks and crevices, and uniformly distributed in a moderately thick layer over the whole of the affected epidermis in order that the physiological and therapeutical properties possessed by the paste may be justly fulfilled.

THE VALUE OF THE DIFFERENT METHODS OF BOWEL UNION.

FOWLER (*Annals of Surgery*, July, 1899) has abstracted an article by Chlumsky (*Centralblatt für Chirurgie*, 1899, ii) based on an experimental investigation on dogs and human cadavers. The tests were made by means of hygrometric pressure.

In the human bowel the intact intestinal wall alongside of the anastomosis was torn earlier than the site of the anastomosis itself. Recent intestinal unions in dogs, applied in the living animal and examined at once, appeared to be less resistant than those in the bowel of the dead dog.

The firmness of the intestinal anastomosis applied in the living dog diminished continuously for the first four days. During the first twenty-four hours it diminished only moderately, unless the peritoneal inflammation due to the operation was very severe at the site of the anastomosis and its neighborhood (100 to 200 millimeters hygrometrically); if the loops of anastomosis were markedly reddened or otherwise considerably altered, the firmness of the anastomosis diminished surprisingly after twenty-four hours (20 to 100 millimeters hygrometrically); forty-eight hours following operation, in case of slight inflammatory reaction, the resistance was still less (80 to 120 millimeters hygrometrically), and diminished still more during the next twenty-four hours. On the third and fourth twenty-four hours, the lowest resistance was regularly reached (50 to 90 millimeters hygrometrically).

On the fifth day the resistance to pressure increased (50 to 120 millimeters hygrometrically), and on the seventh day increased to the resistance of the recent anastomosis (150 to 340 millimeters hygrometrically). Twenty-four days following, the original resistance was increased (250 to 350 millimeters hygrometrically).

Ten days following operation, the intact bowel tore before the site of anastomosis gave way (height of pressure 380 to 400 millimeters hygrometrically); and on the fifteenth day in only one case did the anastomosis tear before the uninjured bowel wall. Thirty days after operation, and in one case 120 days after, the resistance of the site of anastomosis and the bowel wall was nearly equal.

At first sight it is surprising that such low pressure will tear the anastomosis between the third and fifth day. One would imagine that the solidity of the anastomosis would steadily increase. This can be readily explained. During the first two days the parts are fixed mechanically by the suture or button. The parts gradually become infiltrated and consequently less resistant, thus offering a less secure hold for the fixing elements. Every operator knows what small resistance most tissues possess two to five days after a trauma. In the intestinal wall the conditions are similar.

Further, anastomosis by button did not differ materially from anastomosis by suture; either was torn by approximately the same amount of pressure. In case of simple mechanical traction the anastomosis by button gave way earlier, especially when the button was cast off or absorbed before the fifth day. Attention is drawn to the fact that in certain cases in which the Murphy button was used, even in cases of recent anastomosis, while the anastomosis gave way sufficiently to allow the button to show, yet no fluid escaped for some time after. This is accounted for by the integrity of the purse-string suture fastening the intestinal wall to the button.

As a general rule, however, circular anastomosis stood a higher pressure than lateral. In recent anastomosis, done by suturing, the site of rupture was almost always at the point where the knot of the continuous suture lay. This was particularly so if two knots lay together. If the continuous sutures were first tied separately and then together the perforation was always at this point.

All the anastomoses were exceedingly fragile from the third to the fifth day. In two cases, in spite of the greatest care, the anastomosis was torn before the manometer examination. Adhesions to neighboring structures, especially to omentum, were regularly present. During the first few days the site of anastomosis was found almost entirely encircled by portions of the greater omentum. Later, after weeks and months, these adhesions were less numerous, but in only two cases were they entirely absent. In one case, the serous surface being scarified after Wölfler's method, the adhesions were so nu-

merous that it was extremely difficult to identify the site of anastomosis. Anastomoses the seat of adhesions withstood a higher pressure than those not so supported. In one case a small flap of the greater omentum around the site of a button was sutured, with excellent result.

In regard to button methods, the results were not so favorable. Chlumsky concludes that a button must stay in a dog's bowel at least five days, protecting the site of anastomosis in a purely mechanical manner; if left longer than a week it is apt to cause necrosis. In one case a Murphy button passed *per anum* three days following its application—that is, at a time when its presence was most essential. In another case it caused perforation on the third day. The result with decalcified bone button was still more unsatisfactory. All of these absorbable buttons, particularly Frank's, were absorbed early, or soon passed in a half-digested condition. Hardening or partial decalcification afforded but slight improvement.

In two children, the subjects of gastric fistulæ, because of stenosis of the esophagus due to potash burns, the author had the opportunity afforded of introducing into their stomachs small undecalcified bone olives. These were in a stage of advanced digestion after two or three days. Decalcified bone olives, left in the same time, became as soft as butter. In the colon, however, they remained unaltered for from seven to ten days.

THE IMPORTANCE OF BLOOD EXAMINATIONS IN REFERENCE TO GENERAL ANESTHETIZATION AND OPERATIVE PROCEDURES.

FISH (*Annals of Surgery*, July, 1899), who is profoundly impressed by the dangers incident to anesthetization, contends that a solution of the problem of safety in anesthesia can be attained only in the laboratory.

In the blood we have a gauge, the readings of which give us a fairly accurate insight into our patient's general condition. While being of the greatest diagnostic and prognostic value, it acquaints one with conditions operable and inoperable. If the cases are inoperable, so far as the resistance and reactionary powers of the individuals are concerned, it shows by a regenerative treatment when they become operable or when operative procedures should be refrained from altogether.

Neurasthenics, anemics, chlorotics, leucemics, and those of a so-called lymphatic temperament, withstand general anesthetizations and operations poorly, and in all these the blood shows marked changes from the normal, which is believed to account for the difficulties and dangers attendant upon operative procedures in these individuals.

It is imperative that a routine practice of blood examinations should be instituted by surgeons and by internes of surgical hospitals in conjunction with the methods established, giving us thereby absolute indications for palliative or radical treatment.

The specimen of blood to be examined is taken from the lobe of the ear or finger-tip by a small puncture, after thoroughly washing with soap and hot water, and is then examined for—

1. Its specific gravity by Hammerschlag's method.

2. Its reaction by the method of Leibreich.

3. Its absolute and relative number of red and white corpuscles by the Thoma-Zeiss counter; also the shape, size, and color of the former, and the varieties and staining properties of the latter.

4. Its hemoglobin percentage, as given by the instrument of von Fleischl.

The specific gravity indicates grossly pathological conditions of the blood elements, and gives us a fairly accurate estimate of the hemoglobin percentage.

The reaction is important from the fact that individuals whose blood shows a decrease in alkalinity withstand general anesthetizations and operations poorly.

The number and characteristics of leucocytes are of the utmost importance from a diagnostic and prognostic standpoint; for, besides influencing to a greater or less extent the production of safe anesthesia, they also indicate with accuracy when to and when not to operate in certain cases, as is shown by the following:

1. Infection, mild; resistance, good; small leucocytosis.

2. Infection, less mild; resistance, less good; moderate leucocytosis.

3. Infection, severe; resistance, good; very marked leucocytosis.

4. Infection, severe; resistance, poor; no leucocytosis.

The above can be surgically interpreted into: (*a*) When to employ palliative means of treatment; (*b*) when to consider operative intervention; (*c*) when to operate; (*d*) when not to operate.

In individuals whose blood presents a

hemoglobin percentage of fifty or less, the anesthetic vapor produces quickly an increased pathological condition by a forced abstraction of oxygen from a tissue ill-conditioned to part with it; or, the hemoglobin percentage being so small, the compound resulting from the anesthetic vapors controls its ability to take up the requisite amount of oxygen and imparts it to the tissues as under normal conditions. Hence it is not surprising that these individuals show quickly signs of collapse. Besides certain nervous forces, respiration is dependent upon the amount of hemoglobin contained in the blood, and if this is reduced beyond a certain limit, respiration must cease. The minimum is apparently twenty per cent, as in three cases dying of collapse after operation Mikulicz found only fifteen per cent remaining.

A safe rule to follow is, never produce a general anesthetization in an individual whose blood shows a hemoglobin percentage of less than fifty.

Safe anesthesia is dependent upon, first, the percentage of hemoglobin in the blood before, during, and after anesthetization; and secondly, a normal or increased number of the polynuclear neutrophiles. Anesthetic vapors may be inhaled with impunity just so long as the hemoglobin percentage remains higher than the physiological requirements of the system, and the phagocytic or reactionary powers of the polynuclear neutrophiles are not overcome by the anesthetic compound.

Oligochromemia, from whatever cause, should invariably be considered as a contra-indication for the administration of a general anesthetic for diagnostic or operative purposes.

OBSERVATIONS UPON VOLVULUS, WITH REPORT OF THREE CASES SUBMITTED TO OPERATION.

ELIOT (*Annals of Surgery*, July, 1899) has operated upon three cases of obstruction of the bowels, due to volvulus. In one case the operation had to be repeated twice for the relief of recurrence. One case died.

In all cases where volvulus is suspected a rectal examination should invariably be made. If the sigmoid is twisted, the introduction of a sufficiently small hand and forearm will detect the obstruction. As this instrument of examination is not usually available, the capacity of the gut below the obstruction should be determined by the injection of water, and by this means it is found that a relatively small amount only can be introduced, and, after being retained for a short time, is more forcibly expelled than normally is the case.

In the rarer enteric variety, the application of this test yields a negative result.

The examination of the abdominal wall is more satisfactory, when conducted after complete anesthesia has been established. Even before this is done, inspection sometimes reveals a condition of local asymmetry due to the distention of the affected loop.

By palpation the distended, elastic, and resistant arms of the twisted loop may be mapped out quite accurately on the abdominal wall, especially when muscular relaxation has followed the administration of the anesthetic. In cases of marked constriction, the paralysis of the affected loops renders them immovable and fixed, so that their position in the abdominal cavity is a constant one. Percussion should be conjoined with auscultation. The area of tympany thus obtained corresponds to the position of the elastic, distended loops.

The treatment of volvulus is both palliative and radical. In a small percentage of cases spontaneous reduction can take place through peristaltic activity alone. This can be occasionally accomplished by the effort of the surgeon. For this purpose reduction may be favored by the inversion of the patient. This neutralizes whatever effect gravity may have had in the production of the difficulty.

When the sigmoid is involved, the use of rectal injections may result in reduction. Eliot notes one case in which intrarectal manipulation by a diminutive hand failed to untwist the gut. This is a measure, however, that might easily succeed in those cases in which the volvulus is of recent formation.

The trial of any palliative measure should not be allowed to consume any considerable length of time, and should be immediately followed in the event of failure by laparotomy.

If an accurate diagnosis has been made, the abdominal cavity may be opened in that part immediately overlying the affected loop. If, on the other hand, the diagnosis is uncertain, the median incision is preferable, as it allows a rapid examination of the abdominal contents, an accurate diagnosis of the nature of the difficulty, and usually through it the particular method of treatment indicated may be satisfactorily carried out. If the affected loop cannot be easily

reached through such an incision, a second lateral one may be quickly made without subjecting the patient to any additional risk, and without causing any increased weakness of the abdominal wall, in the event of ultimate recovery. This method of procedure is indicated particularly in those cases of volvulus of weeks' duration, which resemble obstruction by obturation, especially carcinoma; and in this latter condition, when the sigmoid is involved, the first evidence of the existence of the trouble not infrequently consists in the development of symptoms of acute obstruction. Two such cases, in fact, have come under the writer's attention. To distinguish accurately between these two conditions is particularly important, because in each group of cases the appropriate treatment is entirely different. In carcinoma an artificial anus gives relief; in volvulus, nine cases reported in the literature of the subject, so treated, proved fatal without exception.

With the opening of the abdominal cavity it is absolutely essential in every case to accomplish the reduction of the volvulus by manipulation. This should be gently employed, as laceration of the gut at the point where the two limbs cross has taken place during efforts of reduction.

If the gut proves viable, measures should be taken to prevent the recurrence of the volvulus, provided that the general condition of the patient does not contraindicate this procedure. To attain this end the entire sigmoid flexure has been resected with success, the divided ends being brought together by end-to-end anastomosis. In three such cases one promptly died; one died a month after the operation of septic pneumonia, the peritoneal cavity and sutured gut being found, on autopsy, in a normal condition; and the third recovered. This method of treatment seems ultraradical and dangerous, when simple measures will accomplish the same purpose. It is always difficult in such cases to determine the exact amount of gut which it is proper to remove, and the divided ends, having been at any rate moderately congested before the operation, do not unite with the same degree of certainty as in those cases of resection where no impairment of circulation has previously existed.

Senn recommends the shortening of the mesosigmoid by passing through it successive rows of sutures. It is doubtful whether this is of any practical utility.

The best plan of procedure seems to be the passing of interrupted catgut or silk sutures between the serous coat of the gut and the anterior parietal peritoneum. In those cases in which the constriction has caused death of the gut, the necrotic portion should be removed, and the divided ends brought into the angles of the wound to be united subsequently, when the patient's general strength has been restored.

ON MOVABLE KIDNEY.

WALLACE (*Scottish Medical and Surgical Journal;* quoted from *Journal of Cutaneous and Genito-Urinary Diseases*, July, 1899) believes post-mortem statistics of mobility to be fallacious, as the kidney is more fixed after death than during life, and that no satisfactory explanation has been given either of the reason for the greater frequency of the occurrence on the right side as compared with the left, or of the causes which lead to kidney mobility. The theory that it is more common in women of the poorer classes, who have borne many children at short intervals, the observations of several authors have failed to substantiate, and in his own cases requiring treatment — fourteen in number — thirteen were females, and of these seven were nulliparous, and only one of the others had borne several children and belonged to the poorer classes.

The loss of fat, supposed to be a predisposing cause, the author is inclined to believe to be in reality the result, as it certainly is in the cases with gastrointestinal symptoms. The condition comes on gradually in the majority of cases and gets progressively worse, and the exact time of onset is rarely known, unless due to traumatism.

When palpating the lumbar region for the kidney it may fail to be found, because at the time of examination it may be low down in the iliac fossa — a source of error to be borne in mind.

Clinically, the symptoms are grouped under four heads: (1) Simple mobility without symptoms; (2) pain, described as a sensation of aching and dragging, on the affected side; (3) renal pain, which may be accompanied by hematuria, pyuria, or intermittent hydronephrosis, but not necessarily so; (4) the gastrointestinal disturbances accompanied by, or ending in, neurasthenia. The symptoms, however, are not always commensurate to the mobility.

The affected kidney is usually healthy, and the symptoms, as a rule, wholly subside after fixation of the kidney.

The author accepts Kendal Frank's explanation of symptoms: (1) Some symptoms are common to both kidneys, as the dragging pain, sense of weight, neuralgic pains, fatigue, and debility; (2) some symptoms belong exclusively to mobility of the right kidney, the gastric crises, indigestion, flatulence, vomiting, and pain, which come on about two hours after eating. The symptoms peculiar to the left kidney are not pointed out.

With regard to treatment three classes are to be recognized: (1) Those in which no treatment is necessary, the condition being discovered by accident; (2) those relieved by the wearing of a pad; (3) those requiring operation—nephropexy. For a pad, the author prefers an air-pad, fixed to the corset, and put in position while the kidney is known to be in place.

CURE OF VERY GRAVE ACCIDENTS IN TWO PROSTATICS BY CATHETERIZATION.

JANET (*Ann. d. Mal. d. Org. Génito-Urin.*; quoted from the *Journal of Cutaneous and Genito-Urinary Diseases*, July, 1899) reports two very interesting cases, from the point of view of the choice of surgical intervention.

Both cases were grave. One had urinary intoxication with high fever, the other severe bladder hemorrhage. In both, especially in the latter case, cystotomy was proposed, and decided upon as urgent; nevertheless, simple catheterizations properly applied sufficed to relieve the gravity of the situation.

The first patient, eighty-one years old, had used the catheter for ten years, without any precautionary procedures. His urine had been infected for a long time. There was a residue of a pint of urine after spontaneous urination. At night the patient used the catheter two or three times. The urine was very purulent, a colon-bacillus infection, with evidence of pyonephrosis. He had thirst, dry tongue, anorexia, insomnia, itching of the skin, and gradual onset of fever, mounting to 102.5° F., with marked oscillations, and rapid loss of flesh. Under the catheter, *à demeure*, which was changed every third day, there was gradual improvement, but a purulent urethritis set in, followed by a discharge of pus, apparently due to prostatic abscess. After this occurrence improvement again set in, and by lavage and internal catheterization all symptoms cleared, though the urine remained purulent; but the patient was able to resume his former life.

The second patient, seventy-six years old, had suffered for several years from prostatic enlargement. When first seen he had a purulent residual urine and a very large prostate. Daily catheterization and lavage were advised, under which he did well for several months. Then he began to have severe vesical pain and frequent urination, and a sense of weight. One day a large quantity of blood followed catheterization, which, in spite of treatment, recurred with severity each day, and a tumor was suspected. Cystoscopy was impossible, and the patient entered the hospital for operation. Pending the operation, regular catheterization was instituted every two hours, and the urine withdrawn was replaced each time by an equal amount of boric solution. Under this régime the hemorrhage ceased, and the same procedure was continued for one week. The hemorrhages did not return, the bladder cramps disappeared, and the patient improved. Complete catheterization was then performed, and the intervals lengthened, and light lavage of silver nitrate was made. The urine became clearer. In three weeks the catheterizations were made morning, night, and in the middle of the night; then only twice a day; and the patient began to urinate spontaneously. He was then allowed to return home, and to again catheterize himself.

According to Janet, catheterization is the operation of choice in the retention of prostatics, even in the grave accidents which complicate it.

DIAGNOSIS AND TREATMENT OF DIFFUSE SEPTIC PERITONITIS, FOLLOWING PERFORATING DUODENAL ULCER.

SCHWARTZ (*Bulletin et Mémoire de la Soc. de Chir. de Paris*, xxiv; quoted from the *Brooklyn Medical Journal*, July, 1899) briefly reports four fatal cases of perforating duodenal ulcer, communicated to him by Rochard, Gumiard, Sieur, and Loison. The first of these authors treated the perforation by laparotomy, without result. In the discussion on diagnosis and treatment, Collin's investigations (conducted under Letulle's direction) are quoted. In 262 cases collected, the distance between the ulcer and the pylorus was less than two inches in 242 cases—*i.e.*, was in the upper third of the duodenum. In 85.6 per cent there was a single ulcer; in twenty-six cases two ulcers; in three cases three ulcers; in four cases five

ulcers. The usual site is on the anterior duodenal wall. Duodenal ulcers are far more likely to perforate than ulcers of the stomach. Collin concludes that sixty-nine per cent perforate. In the majority of cases perforation took place directly into the peritoneal cavity; these did not present marked symptoms of disease previous to perforation. In only five cases out of twenty-five collected by Schwartz was any disease diagnosticated previous to perforation — one as dyspepsia, two as gastric ulcer, and two as simple gastralgia.

Pain is a constant symptom, is intense, and is located in half the cases below the right costal arch or in the epigastrium; rarely on the left side. Prostration is rapid. Temperature is usually low, rarely above 100° F. The pulse is markedly accelerated. Vomiting is often absent at the onset, and may not appear for forty-eight hours. There is rapidly increasing rigidity of the abdominal muscles, which prevents palpation of the abdominal viscera. Percussion gives tympany in place of normal liver dulness. Intestinal obstruction is present.

A correct diagnosis was made in a very small proportion of cases, obstruction or appendicitis being diagnosed. The incorrect diagnosis usually resulted in delayed operation. Only three out of twenty-five cases operated upon resulted in recovery, and in only one of the three was recovery permanent. One of these succumbed two months later to ileus, due to adhesions, and the other to a second duodenal perforation six months after operation.

Schwartz advocates early exploratory laparotomy and suture of the perforation. Frequently the greatest collection of pus in diffuse septic peritonitis is in the right iliac fossa and below the liver. If indubitable evidence of disease of the appendix is not present, a further search must be made for the site of perforation.

In the discussion of this subject Tuffier advises gastroenterostomy before perforation has taken place in those cases in which a diagnosis can be established.

TWO CASES OF RESECTION OF THE LARGE INTESTINE, WITH RECOVERY.

Eve's first case (*Medical Press and Circular*, May 17, 1899) suffered from a large left scrotal hernia, strangulated for three days. Herniotomy showed that the sac contained a knuckle of the transverse colon, which was gangrenous. A glass tube was inserted into the intestine, and the latter was attached to the wound. Five weeks later the intestine forming the artificial anus was brought out of the abdomen after opening the peritoneum, and was resected and sutured. The intestine was returned, and the abdomen closed. Primary union and recovery without complication.

The second case was an example of carcinoma of the descending colon. A woman, aged forty-seven, had suffered with pain in the abdomen, vomiting, and constipation for seven months. A tumor in the left loin, just below the ribs, had been noticed for some months; it was movable from side to side, and evidently situated in the descending colon. The constipation culminated in an attack of obstruction, during which the first operation was performed. This consisted in bringing out the tumor with several inches of healthy bowel, and fixing the bowel to the parietes. The bowel was drained by the insertion of a glass tube. Ten days later the protruding portion of the bowel was removed, and the mesenteric edges of the divided ends were brought together with sutures. After allowing an interval of a month for the inflammatory effusion around the wound to become absorbed, an incision was made around the artificial anus down to the peritoneum. The latter was not opened, but was separated from the parietes for about two inches all round the protruding bowel. The free ends of the intestines were refreshed and brought together with Lembert sutures. The parietes were then closed over the bowel. The wound was completely healed three weeks after the operation. At the present time the patient appears perfectly well, and has suffered no inconvenience.

The writer is of opinion that in these and similar cases the bowel should be drained, even although only moderate symptoms of obstruction existed.

Although Murphy's button could be inserted very rapidly and readily, the intestines could not be completely drained, and in this case the shock of the resection was added to the illness from which the patient was suffering.

The author thinks that for the large intestine, at any rate, suture is safer than the use of Murphy's button.

The second case was published especially to draw attention to the merits of extraperitoneal resection and suture for artificial anus

as the safest method. It was introduced by the late Dr. Greig Smith. This operation was attempted in the first case, but had to be abandoned owing to the extreme thinness and friability of the peritoneum. This was probably due to stretching of the membrane from the presence of a large hernial sac in its neighborhood.

CURE OF ASCITES DUE TO LIVER CIRRHOSIS BY OPERATION.

MORISON (*The Lancet*, May 27, 1899) reports a case of ascites due to liver cirrhosis successfully treated by operation, and further records the post-mortem findings in a woman operated on two years ago. These showed clearly the free vascularization of the adhesions which united the liver, spleen, intestines, omentum, and parietal peritoneum. This specimen establishes our belief that an efficient anastomotic circulation can be brought about by operation. There can also be no doubt that this patient was cured of ascites, and that useful life was prolonged to her for two years by the operation. A further examination of the specimen showed the liver to be much atrophied and degenerated. The spleen was at least four times its normal size. It is quite evident that the obstructed portal circulation had nothing to do with the splenic enlargement—in this case at all events—for the new anastomotic circulation was clearly more than sufficient to compensate for any diminution in size of the portal vein.

The author states that it is more rare than he thought to see uncomplicated cases of liver cirrhosis and ascites. Valvular heart lesions, thoracic aneurism, albuminuria, and glycosuria are the most frequent complications which he has met with, and each would seem to contraindicate operation, because but seldom can the latter be but temporary. Of the two previously recorded cases one was successful in curing the ascites, the other was not. The clinical diagnosis of liver cirrhosis was not in the latter case corroborated by surgical examination of the liver, and Dr. William Ewart suggested at a meeting of the Harveian Society of London on April 6, 1899, that this case might be similar to one under his care. In his case the operation failed to cure an obstinate ascites which was believed to be due to liver cirrhosis, and his patient died, like the author's, several months after the operation. In his case the post-mortem examination showed a universally adherent pericardium, stiffened by a layer of calcareous salts which must have precluded the contraction of the ventricles. The liver was not cirrhosed.

The author has now operated on four cases. Two were uncomplicated and were regarded as suitable cases for operation, and both of them were cured. In one the diagnosis was doubtful, and in another the complications were such as to preclude recovery.

The conclusions which the author has come to are as follows:

1. Ascites due to liver cirrhosis can be cured by the establishment of an efficient anastomotic circulation.

2. Adhesive peritonitis produces adhesions between the abdominal contents and its parietes, in which new blood-vessels form. If there is any demand for the new blood-vessels they remain permanently.

3. The operation described in the paper by Drummond and himself (*British Medical Journal*, Sept. 19, 1896) is the safest and most certain method of producing adhesions.

4. It is no longer advisable to treat the ascites due to cirrhosis by repeated tappings if the patient is otherwise sound and in fair general condition. After one or two tappings have failed operation offers the best chance of a prolonged and useful life.

A SERIES OF CASES OF ARTHROTOMY FOR THE RELIEF OF PAIN, REMOVAL OF SYNOVIAL FRINGES, LOOSE BODIES, AND FIBRO-CARTILAGES.

LOCKWOOD (*Medical Press and Circular*, May 17, 1899) first referred to four cases in which the wrist-joint had been opened for the relief of pain. Two of these occurred in women, and were possibly pyemic. The joints were opened by longitudinal incision between the extensor tendons, and were drained for some days, after which the wound completely healed. The relief from pain was immediate and permanent. The third case occurred in a man, and was proved by histological examination to be tuberculous. It was treated in a manner similar to the two former cases. Pain was immediately and permanently relieved, and the disease was arrested. The fourth case also occurred in a woman. The inferior radioulnar articulation was inflamed, and had been for four years, and was the seat of extreme pain. It was opened by dorsal incision, and as the cartilage covering of

the lower end of the ulna was eroded and the bone inflamed, the head was removed. The incision was closed without drainage, pain ceased, and the ultimate recovery was perfect.

It was pointed out that in all these cases the operation was performed for the relief of pain. Mr. Lockwood had often performed arthrotomy in cases of acute septic arthritis in which pain had been present. Obviously, under these circumstances, the operation was not performed for the relief of pain, but to give exit to septic or purulent fluid.

Arthrotomy for the removal of inflamed and elongated synovial fringes was next referred to. The case of a married woman was described at length. For six years she had had repeated attacks of synovitis; latterly the swelling and inflammation of the knee-joint had become almost continual. The symptoms were very like those which are caused by the presence of a loose body within the joint. None could be detected, and the joint was opened. The absence of a loose body was confirmed, but the whole of the synovial fringes of the joint were observed to be exceedingly long and inflamed. It seemed likely that some of them might have been nipped betwixt the articular surfaces. They were all removed. For this purpose the ligamentum patellæ was divided. A speedy recovery ensued. Nine months after the operation she said that the knee was better than it had been for years; she was able to walk about and perform her household duties. The movements of the joint were good and painless; it contained no fluid. Mr. Lockwood thought the membrane was still a little swollen. In connection with this case, the best manner of opening the knee-joint for the total removal of fringes was discussed. Another case of a similar character was likewise described.

Next some cases of arthrotomy in chronic osteoarthritis were described. These were undertaken because the chondrifical and ossified synovial fringes got betwixt the articular surfaces, either by having become detached or because of very long pedicles. One of these patients was in her seventieth year. Nevertheless, three weeks after four loose bodies had been removed from the joint she was walking about. In a second case, in addition to pedunculated cartilaginous fringes, a pedunculated fatty growth of the synovial membrane was taken away. In yet another case of osteoarthritis a pedunculated fringe was removed. The joint ceased to lock, but the operation was followed by a certain degree of stiffness due to the progress of the osteoarthritis. The avoidance of this complication was discussed.

Finally cases of excision of the internal semilunar fibrocartilage were mentioned. One was described in which the history four years after the operation showed that the result had been perfect. In a second case of removal of the internal semilunar fibrocartilage the history was brought down to three years after the operation. With the exception of the scar the knee-joint was normal. The patient led a most active life and considered the joint as good as the other, quite perfect in spite of the absence of the fibrocartilage. The third case was peculiar, having occurred in a woman. In this, again, the removal of the fibrocartilage, whilst curing the locking of the joint, was attended with no other appreciable effect.

SENILE ENDOMETRITIS.

J. Lorain (*La Revue Médicale;* quoted in *Annals of Gynecology and Pediatry*, May, 1899) says that one of the first symptoms of senile endometritis is a semipurulent yellow or greenish discharge, often streaked with blood, and occasionally offensive; the discharge is sometimes continuous, sometimes intermittent. Metrorrhagia is not rare, and is occasionally so marked as to give rise to what is described as the hemorrhagic form of the disease; the loss of blood is, however, rarely great, and never by itself constitutes a grave symptom.

The disease is usually but slightly painful, the subjective symptoms being limited to a feeling of weight in the hypogastrium and to sacralgia. Sometimes, however, the patient complains of smarting and itching about the vulva; in most cases this is due to the irritation of the discharge, but occasionally no signs of inflammation are present. Frequency of micturition and pain after the act are sometimes observed.

There is little tendency for the inflammation to spread to the Fallopian tubes, but this does occasionally take place. Perimetritis and parametritis are practically never found.

The uterus is usually found to be of normal size, mobile, but slightly tender; the speculum reveals a cervix more or less inflamed, of a deep red color, swollen and smooth. Cervical erosion is rare.

The course of the disease is essentially a chronic one; the symptoms become more marked after exertion and fatigue; but the acute or subacute exacerbations found in endometritis anterior to the menopause, and probably due to menstrual congestion, are not found in senile endometritis.

The general condition of the patient is always to some extent affected by the disease; loss of flesh, anemia, dyspeptic troubles, occasionally rigors and night sweats, and, in fact, a condition of cachexia more or less marked, are found.

The diagnosis of senile endometritis is of the greatest importance, owing to the resemblance its symptoms bear to those of cancer of the body of the uterus. The treatment depends essentially on an accurate differential diagnosis. If the disease is merely endometritis, medical treatment will always guarantee a cure. On the other hand, if the disease is cancer of the body, hysterectomy, at least in the early stages, is the only rational treatment, and the prognosis becomes grave, not only by reason of the dangers of the operation itself, but also because of the grave risk of a recurrence of the disease.

Treatment should have two ends in view: (1) To allow of the free escape of the secretions of the uterine mucous membrane; (2) the application of antiseptics to the interior of the uterus.

The free escape of the contents of the uterus is of special importance, since, as long as these are pent up in its cavity, no cure can be expected. Generally speaking, the dilatation of the cervical canal is best effected by Hegar's dilators; but cases arise in which the stenosis of the cervical canal is so advanced that the smallest dilator cannot be introduced; in such cases dilatation must be obtained with laminaria tents. It is generally sufficient when the passage of Hegar's No. 7 or 8 can be effected, but this will often require two or three sittings at intervals of twenty-four or forty-eight hours. After dilatation, one of the following solutions should be applied to the cavity of the uterus:

Creosote,
Glycerin,
Alcohol, equal parts of each.

Or,

Ichthyol, 10 parts;
Glycerin, 40 parts.

Or pure tincture of iodine should be applied.

These are introduced into the uterus by means of a flexible sound, the last two inches of which is surrounded by cotton-wool; this is then soaked in the solution and applied to the whole surface of the uterine mucous membrane. The treatment should be renewed two or three times a week, and in the intervals a drain of antiseptic gauze should be left in the uterus, a tampon of similar gauze being left in the vagina.

As the cervical canal tends to contract up again between the dressings, it will be found necessary to further dilate it from time to time.

The duration of treatment carried out according to the above principles will be found to be approximately from three to four weeks.

OPERATIVE TREATMENT OF GLANDULAR HYPOSPADIAS.

Von Hacker (*Beiträge zur Klinischen Chirurgie*, Band xxii, Heft 1; quoted in *Annals of Surgery*, June, 1899) recommends an operation differing considerably from the ordinary methods. The urethral orifice, together with its corpus spongiosum, is freed from its surroundings, the dissection being carried well backward. The glans is tunneled through, the urethra is pulled forward, and the meatus is sewn to the external surface. The advantages claimed for the operation are:

1. It does away with the necessity of operating in several sittings.

2. It insures greater certainty of union, other methods frequently requiring repetition of the operation and secondary measures for closure of fistulæ.

3. As there is an absence of any canal requiring to be covered over, a catheter *á demeure* is unnecessary. No subsequent constriction of the opening is to be apprehended.

4. The urethra remains surrounded by its corpus cavernosum, and the new external orifice by erectile tissue in a nearly normal fashion—the latter circumstance being highly desirable for the proper ejaculation of semen.

Reviews.

A Text-book of Pharmacology and Therapeutics; or the Action of Drugs in Health and Disease. By Arthur R. Cushny, M.A., M.D. Illustrated. Price, $3.75.
Philadelphia and New York: Lea Brothers & Co. 1899.

The announcement that Dr. Cushny was about to publish a book on Pharmacology was hailed with interest by the American

medical profession, because those who are interested in scientific therapeutics recognize the fact that his training and experience well qualify him for the preparation of such a manual. The book has appeared, and we have given it an exhaustive and thorough examination; after doing this we wish to give it the highest praise which is in our power, and to express our sense of obligation to Dr. Cushny for having prepared so competent a volume.

After saying this, and with no intention of modifying it by what we may say further on, we shall consider ourselves at liberty to differ from the author in certain statements which are made.

The opening pages of the book, dealing with the general consideration of the subject of pharmacology and therapeutics, are admirable, although we are somewhat disappointed that under the section devoted to the chemical character of drugs more is not said about the relation of chemical constitution and physiological action. Of course, this subject is as yet almost an untilled field, and yet it is a very important one. We are interested to note the classification of drugs which has been made by this author, and while it is a classification instituted by older and more experienced pharmacologists, and somewhat modified by him, we think that like all other classifications which we have seen it is open to many objections. As an illustration of the fact that this classification is difficult, we find that the nitrites are classed under the heading of "organic substances characterized chiefly by their action after absorption." Surely the nitrites can hardly be called organic substances in the ordinary sense of the term, nor can formaldehyde, benzol, and similar substances come under this heading by any consideration except that of utility. We believe that the author recognizes this fact as well as we do.

The remarks made by Dr. Cushny in regard to the methods by which pharmacology and therapeutics should be taught seem to us singularly appropriate at this time.

It strikes us as somewhat odd that many of the drugs are classed under the names of their active principles rather than under the name of the crude drug; thus we cannot see why lobelia should be considered under the heading of lobeline, or tobacco under nicotine, or veratrum viride under veratrine. Surely the physiological action and therapeutic uses of veratrum viride in the form of a tincture or fluid extract are not in any way similar to those of veratrine, and many physicians who are in the habit of considering veratrum viride a valuable drug will not be satisfied with finding but two and a half lines devoted to its uses, nor believe in the statement that as the activity of veratrum viride is due to veratrine it may well be discarded from the Pharmacopœia. This statement is so utterly antagonistic to the opinion of many reputable practitioners that it does not require further criticism and may be considered as distinctly erroneous.

We do not think that under the consideration of antipyretic drugs sufficient emphasis is laid upon the fact that these drugs diminish the production of heat as well as increase the dissipation of it, neither do we agree with the author when he states that there seems to be no reason why the combination of the two methods—that is, cold bathing and coal-tar products internally—should not prove more efficacious than either alone. In this instance such a combination is distinctly deleterious in its influence. The great objection to all the coal-tar products in practice is that they destroy the patient's reaction. The greatest advantage in cold-bath treatment in all its forms is that it improves the patient's reaction, and the use of the coal-tar products simultaneously with the cold bath exposes the patient to internal congestions and deprives him of the physiological process by which he would not only resist the effects of cold but obtain advantage from it.

We also differ from the author very distinctly in the statement that in therapeutics digitalis never causes irregularity of the heart. Those who have had experience with digitalis when given in full doses and continued to the point of irritability very frequently find that it produces marked cardiac irregularity. Again, we do not think that the statement that digitalis does not influence the heart favorably through its effect on the pneumogastric nerve is correct, and the comparative statement that aconite, which stimulates the pneumogastric, does not improve the heart is not a fair comparison.

Finally, the statement that the action of digitalis is the same as ergot in stopping hemorrhages from small vessels may be correct, but neither of them is of any practical value, we believe, for this purpose.

In the consideration of saline cathartics nothing is said of their use in the treatment of peritonitis, which we think is an unfortunate omission, but we heartily agree with the

author in his statement that the hypophosphites are not the remedies which they are "cracked up" to be. We have long believed the usefulness of the hypophosphites in the treatment of disease is greatly exaggerated.

What Dr. Cushny has to say about the value of lithium for uric acid is not only of interest but exceedingly valuable, and it is evident that the lithia salts are by no means as useful in this condition as some persons would have us believe; in this we entirely agree with him.

Dr. Cushny states that lime salts are not likely to be of benefit in rickets unless it is due to lime starvation, a condition which is not likely to arise in a human being. In the treatment of phosphorus poisoning we regret to see he recommends the employment of turpentine oil, which in its ordinary employment we believe to be valueless. We do not think he emphasizes the value of permanganate of potassium sufficiently.

Credit is given for the introduction of calomel in the treatment of dropsy to Jendrassik, when it really ought to be given to Dr. John Kearsley Mitchell, father of Dr. S. Weir Mitchell, who as professor of practice in the Jefferson Medical College taught this use of calomel before Jendrassik was a practitioner of medicine.

While the bibliographical references which are appended to most of the articles show that the author has a wide knowledge of European pharmacological literature, and while it is true that American and English pharmacological literature is comparatively scanty, we regret that so few references to English and American researches are made. Surely some of them have been of sufficient value to have some influence upon the statements made in his book; but we can readily understand that as Dr. Cushny received his pharmacological training chiefly in a German university his acquaintance with German literature overshadows his acquaintance with that in other languages.

After these criticisms, which are criticisms of detail rather than of the whole book, there is nothing left but to reiterate the words of praise with which we began this review.

A sufficient amount of therapeutic information is not to be found in the volume to make it useful to the practitioner; and as we understand it Dr. Cushny did not intend to prepare a work on therapeutics, but did intend to prepare one upon pharmacology, and in this respect he has attained a noteworthy success.

MATERIA MEDICA, THERAPEUTICS, MEDICAL PHARMACY, PRESCRIPTION WRITING, AND MEDICAL LATIN. A Manual for Students and Practitioners. By William Schleif, Ph.G., M.D.

Philadelphia and New York: Lea Brothers & Company, 1899.

The book before us is a small octavo volume of about 350 pages, in which the drugs are classified in a manner closely resembling the classification of drugs adopted by H. C. Wood in his well known "Therapeutics;" indeed, in some respects it may be considered a condensed manual of that work. As is seen from the title, the author has made its pages cover a very wide field, but when one reads the book it is discovered that it deals with drugs chiefly, and to a very slight extent with prescription writing and medical Latin. Naturally the book follows very closely the teachings of Dr. Schleif's superior, Dr. H. C. Wood, and will doubtless prove popular with the students of the University of Pennsylvania and others, who will find in it much of the information which they desire.

ANNUAL REPORT OF THE SUPERVISING SURGEON-GENERAL OF THE MARINE HOSPITAL SERVICE OF THE UNITED STATES FOR THE FISCAL YEAR 1898. Washington: Government Printing Office, 1899.

The present volume is the twenty-seventh annual report of the Marine Hospital Service, and this is the one hundredth year of the existence of that service. The report is of unusual interest because it embodies a period in which our relationship with neighboring countries, in which a number of contagious diseases are endemic, has become more than ever intimate. Each year shows an increased activity in scientific effort among the members of this very valuable branch of the Government, and Dr. Wyman, the Surgeon-General, is to be congratulated upon the high standard and efficiency which the service has attained under his executive control.

A COMPEND OF DISEASES OF THE EYE AND REFRACTION, INCLUDING TREATMENT AND SURGERY. By George M. Gould, A.M., M.D., and Walter M. Pyle, A.M., M.D. Second Edition, Revised and Enlarged.

This is one of Blakiston's well known quiz compends, and is written not in the form of questions and answers, but in the manner in which a small manual is usually composed. It is needless to say that the authors, who are careful workers in everything which they undertake, have taken pains to make accurate every statement in its pages, and while it does not in any way attempt to present original characteristics, it is a first-rate brief guide to ophthalmic practice.

INDEX CATALOGUE OF THE LIBRARY OF THE SURGEON-GENERAL'S OFFICE, U. S. ARMY. Authors and Subjects. Second Series. Volume IV: "D" to "Emulsions."

Washington: Government Printing Office, 1899.

This is the fourth volume of the second series of this work, which is of inestimable value to the people of this and other lands. It contains 9628 Author Titles, representing 4133 volumes and 8523 pamphlets; it also contains 8828 subject titles of standard books and pamphlets, and 28,316 titles of articles in periodicals.

When it is remembered that the library of the Surgeon-General's Office now contains 130,708 bound volumes and 220,839 pamphlets, its size and value will be appreciated.

Correspondence.

LONDON LETTER.

BY RAYMOND CRAWFURD, M.A., M.D. OXON., M.R.C.P. LOND.

Dr. Short's paper to the Midland Medical Society on the "Treatment of Occupation Neuroses" is worthy of attention for his very common-sense treatment of these much abused disorders. His remarks on writer's cramp are particularly to the point. It is idle to enjoin complete rest to a class of patients for whom such is an impossibility for pecuniary reasons, and complete rest is only essential in the early stages, when pain is present. Such pain is best relieved by the local application of belladonna, and rest. After the relief of pain, the most important point is to keep up the nutrition of the muscles by passive movements and electrization, at the same time encouraging in the patient a confident hope of recovery, as in most of these cases a powerful mental influence is at work. Active muscular exercise of some kind should be insisted on, such as carpentering, or knitting, so as to maintain the power of the hand muscles, while at the same time giving relief from the actual work of writing. Care, too, must be bestowed on the actual mode of writing; this will usually be found to be cramped and throwing all the work on the small muscles of the hand. Writing from the shoulder should be studiously cultivated, and this can be best effected by writing large letters on a blackboard or on a sheet of paper on the wall; the position of writing necessitates then the use of the shoulder muscles. Twenty minutes of this exercise twice a day is sufficient at first. With these precautions carefully obeyed, some amount of writing may usually be permitted to the sufferer in his daily occupation. Here, too, much can be done by attention to details. The table should not be too high for the chair, or undue pressure will be exerted on the ulnar border of the forearm and irritate the ulnar nerve. A thick penholder is better grasped than a thin one, and it should not be unduly light, as this diminishes its momentum in writing. Ball-pointed or quill nibs are the best, but a quill pen is too thin for an easy grip. The study of shorthand is a very excellent training of the muscles of the hand, and may be of commercial value to the patient. It is a first-rate training of delicate movements, and it is a familiar fact that shorthand writers are singularly exempt from writer's cramp. Text-books dismiss the treatment of this distressing ailment with the magic word "Typewriter," but in the practical work of the office type and manuscript are seldom interchangeable. Over and above this, all such measures are indicated as promote well-being of mind and body.

The annual meeting of the British Medical Association at Portsmouth has come and gone. It has been voted on all hands a success, not perhaps in the sense that the Association might have wished, however. Statistics are sometimes misleading, but when I tell you that out of 900 members present at Portsmouth, only twenty-five were present at some of the sectional meetings, while the remaining 875 disported themselves on the waters of the Solent, you will agree with me that as a nation we no longer "take our pleasures sadly;" albeit the Association was established "for the promotion of medical and the allied sciences, and the maintenance of the honor and the interests of the medical profession." On the whole the interest of the meeting centered on the prevention and treatment of tuberculosis—a time-honored theme that in England has only recently been admitted within the pale of practical therapeutics. There was a great deal of interesting material in the Section of Pharmacology and Therapeutics, presided over by Professer Bradbury. Dr. Lauder Brunton dealt in his charmingly transcendental manner with headaches and their treatment. Migraine he ascribed to toxins circulating in the blood; in health these toxins were

rendered innocuous by the activity of the liver. We fancied that Dr. Brunton suggested that the reason why the head was most often affected was that commonly this was the seat of lowest physiological resistance. This is decidedly an unpleasant reflection, though Dr. Brunton specifies such minor and non-psychical defects as carious teeth and errors of refraction. The necessity of a major premise to give verisimilitude to his conclusion induced Dr. Brunton to assert that there was a form of "headache" which occurred in the abdomen, due likewise to general toxemia. In treatment, and therein we bow the knee to Professor Brunton, he urges the use of cholagogues, and more particularly of salicylate of soda—preferably in combination with bromides. Whatever is taken must be taken before the headache is fully established, as absorption by the stomach is then at a standstill, and no drug given by the mouth will produce any effect.

Dr. Burney Yeo followed with a very practical paper on "Intestinal Antiseptics." He cited Dieulafoy's experiments upon the bacillus coli as the scientific basis for their employment. Dieulafoy showed that the virulence of this organism was markedly enhanced by a suitable environment; in fact, the organism may be regarded as innocuous in the normal conditions of health. Logically, then, changes of environment, such as may be effected by antisepsis, should serve to modify the virulence. Incidentally Dr. Yeo alluded to the value of antifermentatives in the treatment of many disorders of digestion, and the value of intestinal irrigation of the bowel with sterilized water in cases of summer diarrhea. In this country Dr. Yeo is rightly regarded as the pioneer of the antiseptic treatment of typhoid fever, and those who have seen his results with chlorine water and quinine will certainly be loath to relinquish this method. Dr. Yeo has always maintained that the use of chlorine water as a routine method in all cases of typhoid fever is absolutely unscientific, and very harmful. The virulence of certain cases of typhoid fever appears to depend on the associated activity of other putrefactive organisms; on the virulence of these chlorine water has a very marked effect, deodorizing the excreta and lowering the septic fever in a marked degree. In mild cases, where the fever is low, no conceivable advantage can be derived from chlorine, which has no controlling influence over the activity of the typhoid organisms; moreover, the chlorine mixture is apt to irritate the stomach and interfere with its function, just when its activity is needed unimpaired. In certain indefinite febrile affections pointing to intestinal disorder, Dr. Yeo advocated the employment of thymol by the mouth, and irrigation of the large bowel with eucalyptol, olive oil, and soap and water. In the early stages of typhoid fever Dr. Yeo recommended the use of calomel and salines. Salicylate of bismuth and carbolic acid were both of use in appropriate cases. Salol he had found disappointing, or rather uncertain in its action.

Dr. Hugh Walsham made a communication on some cases treated with erythrol tetranitrate. This drug, it will be remembered, was introduced to the public a few years ago by Dr. Bradbury, the President of the Therapeutic Section. In some cases it is certainly more effective than nitroglycerin, but it has scarcely received the attention it deserves from some quite unfounded fear of its explosive properties, based on its abuse in one or two instances. Dr. Walsham pointed out that this danger could be absolutely forestalled by giving the drug in chocolate tablets. He had found it of use in angina, in Raynaud's disease, and in the sleeplessness of chronic interstitial nephritis. Professor Bradbury confirmed these observations and mentioned incidentally that he had given a patient as much as one drachm twice a day.

The papers by Dr. Schiff, of Vienna, on "The Use of the X-rays in the Treatment of Skin Diseases," and by Dr. Hall Edwards, of Birmingham, on the "Therapeutic Effects of X-rays on Lupus," were both of very great interest. As long ago as 1896 Dr. Freund, of Vienna, used x-rays successfully in the treatment of hypertrichosis, and this had encouraged Dr. Schiff to test its efficacy in lupus and other skin diseases, as the active agent of the x-rays, whatever it may be, undoubtedly penetrates to the deeper layers of the skin; by graduating the strength of the x-rays the resulting inflammation could be increased or diminished at will. Dr. Hall Edwards regarded the resulting dermatitis as of the nature of an electrostatic burn. The inflammation appeared to cause the root of the hair to separate from the bulb, while the changes set up in the tissues resulted in the conversion of chronic granulations into normal connective and scar tissue. There can be little question from experiments with the x-rays on bacteria that the effect is not bactericidal in character. Dr. Schiff urged on these grounds the efficacy of the x rays

(1) in affections in which the removal of hair for as long as possible was advisable—hypertrichosis, trichorrexis, sycosis, favus, and herpes tonsurans; (2) in cases where a change of the tissues in the lower layers was necessary—acne follicularis, acne rosacea, lupus vulgaris, lupus erythematodes, eczema chronicum, elephantiasis Arabum, and œdema chronicum. Dr. Hall Edwards's paper related to the good results he had found in the treatment of lupus, and these were strikingly attested by the photographs of actual cases.

In the Section of Surgery Mr. Berry's communication on "Seventy-two Consecutive Cases of Goitre Treated by Operation" was received with favor, as from one who has had a very wide experience of these cases. In thirty-three of the cases one lobe of the gland with its capsule had been extirpated, and in thirty-nine adenomata had been enucleated from the thyroid. Mr. Berry at the outset emphasized the fact that many cases of goitre are curable by simple medicinal measures, and this knowledge should give pause to a hasty recourse to operation; and furthermore, the operation should only be performed under exceptional circumstances for mere deformity. Dyspnea was by far the most common plea for interference, and dyspnea tended to occur in two main classes of cases: first, in rapidly growing parenchymatous goitres, in which extirpation is necessary; and secondly, for goitres where the enlargement was low down behind the sternum. Mr. Berry was of opinion that where there is no dyspnea a general anesthetic may be given, but that when dyspnea is present a local anesthetic should be employed. I can confirm Mr. Berry's commendation of the local anesthetic, having more than once seen his operations under a local anesthetic. Mr. Berry declared in favor of the single oblique incision, though the transverse incision leaves a less noticeable scar, because of the greater ease of operation. It is desirable to divide the infrahyoid muscles, not immediately underneath the skin incision, as this endangers adhesion of the cicatrix; it is well also to suture the divided infrahyoid muscles.

In the Section of Ophthalmology Dr. Hinshelwood, of Glasgow, read a paper on "The Use of Euphthalmine as a Mydriatic." Two or three drops of a five-per-cent solution produced dilatation of three hours' duration in twenty minutes, and the effect can be even more rapidly produced by previously instilling a single drop of a one-per-cent solution of holocaine. Euphthalmine has the advantage of being much cheaper than homatropine. Mydrine resembles euphthalmine in action, but is a very expensive drug.

Reports received from Sierra Leone from the expedition sent out by the Liverpool School of Tropical Medicine state that Major Ross has succeeded in proving, as he had surmised, that the malarial organism is propagated by a particular species of mosquito. So far he has succeeded in demonstrating the presence of the organism *in situ*, and has located the haunts of large colonies of the offending mosquito. The next step appears to be to see how far sanitary measures can serve to stamp out the existence of the offender.

The chair of physiology in University College, London, has now been filled by the appointment of Dr. Starling, a young candidate, but one who has already done much original research work.

PARIS LETTER.

By A. R. Turner, M.D. (Paris).

In a recent number of the *Presse Médicale* a treatment of cholera infantum, based on the works of Baginski, Hutinel, Marfan, Sevestre, Thiercelin, and Lesage, is given at length. The author of this article, Dr. Plicque, began by saying that the treatment of this affection is very urgent, and as much so as in a case of appendicitis. Infection, and consequently intestinal poisoning, are the principal factors of what is called summer disease. There exist two distinct varieties of this affection—the febrile form, accompanied by fever, tympanites, a red, dry tongue, which has been studied by Dr. Sevestre, physician of the children's hospital; and the algid form, due in some cases to the preceding one, and ending fatally in a great many cases.

The most important part of the treatment is the diet to be followed. No milk should be given for twenty-four or forty-eight hours, and as the thirst is considerable, water either boiled or sterilized should be given in sufficient quantity. A good mixture is very weak tea with a little iced champagne. Black coffee in small quantities is also useful. Malaga wine with boiled water, and very weak grog prepared with tea, are also useful. Drs. Despine and Picot, of Geneva, have given as much as thirty to sixty grammes of cognac in tea or boiled water. When the condition

is not serious, chicken broth is a good preparation; albuminous water is not so useful as has been thought, as it may ferment. Rice- or barley-water is an excellent preparation, but is often badly prepared. Dr. Marfan has given a good recipe: two teaspoonfuls of barley should be boiled in half a liter of water, then passed through a cloth. About a liter to a liter and a half of liquids should be given daily. About the only drug which has seemed to have any effect is lactic acid. Hayem and Lesage recommend giving every half-hour a teaspoonful of the following solution:

Lactic acid, 3 grammes;
Quince syrup, 25 grammes;
Distilled water, 100 grammes.

The solution should be iced, and after each spoonful some water should be given. After three hours the lactic acid solution should be given only every hour. This preparation should be withdrawn as soon as milk is given again. Intestinal antiseptics are useless; calomel is sometimes useful in fractional doses of one centigramme every three hours. Opium has its defenders, and Despine and Picot consider it as their reserve drug. They give the following solution:

Paregoric,
Lactose,
Spirits of melissa, āā 5 grammes;
Lactic acid, 1 gramme;
Infusion of tea, 100 grammes.

Teaspoonful every two hours until an effect is produced.

Lesage, who has written the article on this affection in the Treatise on Children's Diseases, edited by Comby and Marfan, recommends applying a wet compress on the abdomen. Baths at a temperature of 38° are often useful, but the temperature, according to Lesage, should vary with that of the patient, warm baths being given when there is hypothermia, and cold in the contrary case. Washing out of the stomach and the intestines is a useful method in hospital practice, and an effort should be made to use it in ordinary clientele. Hypodermoclysis with Hayem's or the normal saline solution produces a most excellent result in some cases. From 150 to 300 grammes may be injected daily in five or six injections. Injections of caffeine are also sometimes of benefit.

At a recent meeting of the Society of Neurology Drs. Maréchal and Glorieux gave their results in the treatment of sciatica by copaiba. The usual dose is eight to ten capsules. Dr. Crocq has also published recently in the *Journal of Neurology* an essay on the treatment of sciatica, and wrote favorably concerning ichthyol. In twenty cases of sciatica, fourteen were cured, and there were four cases in which a noted improvement was observed. There were two failures. The mode of administration consists in giving six to eight capsules daily containing ten centigrammes, and using a liniment made with the following formula:

Ichthyol, 50 grammes;
Glycerin, 20 grammes;
Water, 30 grammes.

Certain cases dating from a year were completely cured in this way.

The Dreyfus trial at Rennes, which is exciting so much attention on both sides of the Atlantic, has had its medical aspect too. My readers have already heard of the dastardly attempt that was made on Labori by some miscreant who has not as yet been discovered. By the best of chances there happened to be at Rennes Dr. Reclus, one of the most celebrated Paris surgeons, and Dr. Brissaud, a well known neurologist. It was found on examining the patient with the Roentgen rays that the ball after having pierced the muscles of the vertebral region had flattened itself against the transverse process of the fourth vertebra. Dr. Doyen, who has acquired a world-wide reputation, thanks to his efforts, packed up his instruments and took the train for Rennes as soon as he heard of the accident to his good friend Labori. On the plea of his being a friend, and notwithstanding the fact that he had not been called by the family, he endeavored to inquire into the condition of the patient more than Dr. Reclus thought was discreet. There was a somewhat acrimonious dispute, and Dr. Doyen's case was published in the *Figaro* in an article where the old methods of leaving a projectile were criticized and Dr. Reclus placed in an awkward position. Thereupon the family of Labori published a few lines in which they showed that Dr. Doyen had not been called in, and that Dr. Reclus inspired them with perfect confidence.

At the recent gynecological congress held at Amsterdam, a few words of Dr. Doyen's were taken up in a way which showed that he is not looked upon favorably by the Paris school of surgeons. There is always a certain rivalry between the surgeons of the Paris hospitals and the provincial surgeons, and Dr. Doyen, who left Reims recently to establish himself in Paris, has carried the battle into the enemy's camp.